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PEDIATRICS

A MONTHLY JOURNAL
DEVOTED TO THE
STUDY OF

Disease in Infants and Children

EDITED BY

WILLIAM EDWARD FITCH, M. D.

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EDITED BY

WILLIAM EDWARD FITCH, M. D.

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Vol. XXII **JANUARY, 1910** **No. 1**

EDITORIAL.

SALUTATORY.

On approaching the New Year 1910, the fourteenth anniversary of our birthday, we do so with feelings of mingled pride and regret. Pride that we have been able to give our readers and subscribers fourteen years of unfaltering service and grateful for their cordial and loyal support. Regrets that we have not been able to do more for our many thousand readers and friends who have faithfully stood by PEDIATRICS, ministering to the infant through the “dreaded second summer” of its existence, and nurtured it with the proper literary pabulum, upon which it continued to thrive and grow during the period of early childhood until now—PEDIATRICS—a "big girl" is celebrating her fourteenth birthday with a "New Year's" party.

The New Year is entered with the hope of much greater possibilities. Some changes have recently been made in the editorial policy, which it is hoped will be appreciated. The new management expects, from time to time to add to the interest of the literary pages by inaugurating some special features which are yet *sub judice.*

Thanking our many subscribers for their valued support, our contributors and collaborators for their contributions to our pages, and our advertisers for their patronage, we enter the New Year with renewed hope of being able to give more largely to the profession than ever before.

FLEXNER'S SERUM AS A SPECIFIC IN THE TREATMENT OF CEREBROSPINAL MENINGITIS.

In the early part of the year just closed, New York was visited by an outbreak of "Infantile Paralysis." The daily press referred to it in big headlines.

It is manifestly unsatisfactory to comment upon medical matters as stated by the daily press, but as some time must always elapse before a scientific account of outbreaks of disease reaches the medical press, a word of provisional comment on the alleged epidemic can do no harm. Of course, it is known to all practitioners that acute poliomyelitis is the ordinary cause of infantile spinal paralysis, but the etiology and possibility of contagion or infection are subjects wrapped in much obscurity. Within the past few years a Swedish pediatrist worked out, to his own satisfaction, a demonstration that acute poliomyelitis often appeared in small epidemics, explicable only upon the ground of contagion. He admits, however, that the apparently contagious nature of the disease had already been recognized in several countries, including America. Again, within a year, neurologists have called attention to a number of points of similarity between epidemic cerebrospinal meningitis and acute poliomyelitis. The most striking point of agreement was the occurrence of the Weichselbaum meningococcus in both diseases. This fact, with the frequent occurrence of the two affections in children, and the epidemic character which each may assume, constitute the points of resemblance. It is, however, paradoxical that the two maladies do not at times co-exist or present transition forms; but we must remember that the meningococcus is the apparent cause of several other local infections which bear no resemblance to and have no association with either of the two diseases under consideration. The meningococcus is supposed to be present in nasal mucus (with the picture of coryza) in cerebrospinal meningitis; and the diffusion of the malady is believed to occur from this intra-nasal focus. Hence, it would seem advisable to disinfect the nose in these cases of epidemic poliomyelitis. If the cerebrospinal fluid contain the meningococcus to any extent, lumbar puncture would be rationally indicated.

With this idea in view, Prof. Simon Flexner worked out and introduced the *antimeningitis serum* which has proven a Godsend in the treatment of this dreaded disease. We desire to call special attention to an article by Dr. Louis Fischer on page 27 in this issue reporting several cases of cerebrospinal meningitis successfully treated by lumbar puncture and the hypodermic administration of Flexner's serum injected through the anterior fontanelle. This is something new in Pediatry, now being tried sporadically, and we predict that it will be generally disseminated.

VOODOOISM VERSUS CHRISTIAN SCIENCE.

THE NEW VOODOOISM. The philosophic historian delights to expatiate upon the influence which the inferior and subject race exerts upon the institutions and customs of the superior and conquering people; and, in some cases it really appears that the greater the social and intellectual gulf which separates the races, the greater is the influence exerted by the inferior race. Europeans are fond of pointing out to us how much we have unconsciously borrowed from the red Indian, even our form of government being a copy of the Confederation of the Six Nations. If we have been influenced to such a degree by the red man, who has always held aloof from us, the ways of the black man, with whom we have been closely associated, should have reacted upon us to a still greater degree. As a matter of fact, European musicians of eminence inform us that the only autochthonous music which we possess is of negro origin. For years the white American has preferred to have his minstrelsy served up by "black-face comedians," who delineate the musical side of the negro, and the wide popularity of the banjo, the cake-walk, the "coon-song" and "rag-time" music illustrates the overwhelming influence of the negro upon the white as far as music is concerned. Has the black influenced us otherwise? Has not his superstitious or quasi-religious side inoculated our people in any manner? Decidedly yes. The *natural* religion of the black is Voodooism, and it bears striking analogies to the best known form of faith-healing. If our colored brother's affairs, in health or business, appear to be running counter to what they should, he may consult the Voodoo doctor, who, for a consideration will remove the "hoodoo." This appears to be precisely what the "Scientists" believe and act upon. The negro "hoodoo," like the spell cast upon the "Scientist," proceeds from the envy and malice of enemies. The Voodoo doctor, like the "Scientist healer," is an adept at the absent treatment. He also increases his income by the sale of amulets, charms and the like; and has not the High Priestess of the Scientists reproduced this idea in the sale of souvenir spoons, which the faithful are adjured to buy? On one point, however, the older cult is still in the lead. The Voodoo doctor, if it is made worth his while, will put a "hoodoo" on the patron's enemy, as well as remove one from the patron himself. "Healers" who use the adjective "Christian," for advertising purposes, might find this idea a stumbling block in practice, but we venture to say that the New York "healer" who recently took hundreds of dollars from a blind man, while pretending to cure him, has the right stuff in him to negotiate this impediment, and turn it to his own profit; and that the New Voodooism may soon parallel the old.

"THE DEATH TREATMENT," as described by devotees of this absurdedly non-christian and non-scientific cult is apparently nothing less than a new name for the Voodooism of the ignorant *spell* doctor, among the illiterate negroes of the South and from the jungles in darkest Africa. The press has recently been airing this *tommyrot* and if the description is accurate the "treatment" was administered with practiced skill, for it would have accomplished its supposedly dire purpose in the dead of night, but for the assiduous application of the supposed victim to a difficult piece of darning and the constant repetition of the patent formula "God is good." The description of the "treatment" by the supposed victim has excited much interest, especially among the "Christian Science practitioners."

"CHRISTIAN SCIENCE" AND PEDIATRICS. The claim, so frequently heard of the enemies of medical legislation, that our present medical laws are examples of pure paternalism, and doomed, therefore, to be declared unconstitutional in time, does not apply to the relationship subsisting between medical practitioners and children. For while it may be true that the attitude of the State to the responsible adult, man or woman, is becoming more and more one of *laisser aller,* it is entirely apparent that the State is becoming more and more paternal in its attitude toward the child. It was not so very long ago that a father could slay his child without being called to account for the deed, but during the present century the State has assumed an ever-increasing share of the parental functions, so that hardly a session of the Legislature goes by without the passage of laws intended to protect children from the ignorance and greed of parents and adults in general. We cannot foresee the future attitude of the State toward the practice of "Christian Scientists" upon adults, but we do not believe that public opinion will long permit them to trifle with the lives of little children. A sick child has an inherent right to the benefit of the judgment of those most experienced in dealing with the actualities of disease, and we believe that laws will soon be passed which will protect children up to a certain age of consent, from the criminal neglect of parents, and the inhumanity of "scientists."

The Rev. Sam Jones once said, "if you take an auger and start to bore into a Christian Scientist, you will only get through the skin before you will strike Eddyism and error," and he was not far wrong, for what a mass of foolhardy froth from freakish women is exposed as soon as the limelight of publicity is turned on the "Christian Science" fraud. The editor of *American Medicine* in commenting on this alleged religion devoid of both christianity and science says: "If it was less serious it would be ludicrous, but the danger to weak and immature minds should not be discounted. Many have looked on the Eddyites as nothing but cranks, innocent, ignorant and harmless. Such a view is too charitable, for late developments can leave no doubt that the teachings are doing an infinite amount of harm to the neurotic and impressionable women of the country. Medical men, who realize the menace of psychic instability to every phase of modern life are false to every trust if they fail to show the essential evils of "Christian Science" at every opportunity.

INFANT MORTALITY IN THE U. S. OR "AMERICAN RACE WASTE." Dr. C. L. Wilbur, chief statistician of the Vital Statistics of the Bureau of the Census, in the Census Mortality Bulletin, No. 104, November second, refers to the estimated annual infant mortality as "American Race Waste." Dr. Wilbur maintains, and justly so, that an improvement looking toward the prevention of this *Race Waste* of life—aggregating to from 100,000 to 200,000 deaths in infants and children under five years of age—is the prompt registration of all births and more careful, precise statements of causes of deaths by physicians. In discussing this subject, Dr. Wilbur says: "In analyzing and comparing the totals obtained in the compilation of transcripts of death returns received for the year 1908 by the Census Bureau from the entire death registration area of the United States, as set forth in the bulletin, those for age periods show a somewhat increased per cent. of deaths of infants under one year for 1908, although the ratios for each of the individual years from one to four are identical for 1907 and 1908. Of the total number of deaths, 691,574 returned for 1908 from the entire registration area, it is stated in the bulletin that nearly one-fifth were of infants under one year of age and over one-fourth of children less than five years of age. It is declared that the brute force of the figures representing the actual deaths is more impressive, however, than any ratios or than the rates of infant mortality, even if the latter could be computed in the absence of proper registration of births. More than one-eighth of a million babies under one year of age and fully 200,000 children under five years of age died among about one-half of the total population of the United States in the year mentioned. It is considered probable that fully 200,000 more died in those cities and States not included in the Census Bureau death registration area. It does not seem unreasonable, when we consider the fact that there is apparently no reason why infants, if properly born, and this means simply the prevention of antenatal disease and the improvement of the health and conditions of life of their parents, should die at all in early infancy or childhood, except from the comparatively small proportion of accidents that are strictly unavoidable."

Dr. Wilbur refers to "infant mortality" as the ratio of deaths of infants during the first year of life, and not to population, but to the number of live births annually. This important ratio should be readily secured from our health officer for the comparative study of infant mortality, but Dr. Wilbur deprecates the fact that the great majority of health officers' reports, particularly those referring to registration of births are absolutely worthless and deductions made from them are deceptive and unreliable. In closing he says: In the light of the figures quoted above it would seem that practical sanitation has only made a beginning in the work of preventing the occurrence of infant and child mortality. The ground has only been scratched over. Deep stirring of the soil and thorough cultivation of all the means available, with our present scientific and medical knowledge, for the guarding of young human lives would produce startling, and from all past human experience almost unbelievable, results. Public health, as a function of government, is itself only a creation of the middle part of the last century, dating from the utilization of the knowledge available as a result of the operation of the English laws for the registration of vital statistics (1837). Even in England, however, no systematic efforts have been made until very recent years to utilize to their utmost possibilities the facts already known. The infant mortality of England was higher for the years 1896 to 1900 than for the years 1861 to 1865, and no marked reduction in the early rates occurs until the present decade. It is time that greater attention be given to the subject in the United States. The prompt registration of all births and the more careful and precise statement of causes of death by physicians are essential. Such terms as "convulsions," "marasmus," "debility," and the like, should no longer be tolerated when the true cause of death can be determined.

Forth from the casement, on the plain
Where honour has the world to gain,
Pour forth and bravely do your part,
O knights of the unshielded heart!
Forth and forever forward!—out
From prudent turret and redoubt,
And in the melley charge amain,
To fall but to rise again!
Captive? ah, still, to honour bright,
A captive soldier of the right!
Or free and fighting, good with ill?
Unconquering but unconquered still!

—Robert Louis Stevenson.

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ORIGINAL ARTICLES

THE DYSTROPHIC CONDITIONS OF INFANCY AND CHILDHOOD.*

BY ALEXANDER SPINGARN, A. M., M. D.,

Attending Physician, Department of Diseases of Children, of the Bushwick and East Brooklyn, and of the Jewish Hospital Dispensaries, Brooklyn, N. Y.

REPORT ON M. E.

BY CHARLES EASTMOND, M. D., BROOKLYN, N. Y.

Vertebrae.—Individual bones normal. Whole spinal column has a marked curvature to the right, the point of maximum deviation being at the 10th and 11th dorsal. The curve begins at the fourth dorsal and extends to the fifth lumbar.

Intervertebral cartilages compressed on the concave side of the spinal curvature.

Clavicles.—Normal.

Scapulae.—About normal in size and development but having an exostosis on the upper aspect of the outer extremity of each acromion process.

Ribs.—Left side about normal in shape and development except for delayed ossification anterior to the angle. Right side, lower ribs too slender in the vertebral portion. Lack of development anterior to the angle. Ribs on the right side at more acute angle to the verebral column than on the left.

Humeri.—Short and much thickened with an area of marked increased thickening at the middle. Head not developed especially the left, where the articular surface is apparently absent. Lower extremity well developed but condyles irregular.

Radius.—Head enlarged and somewhat irregular. Shaft, left slightly irregular in outline. Both shafts short but symmetrical. Lower extremity enlarged with apparent overgrowth of the epiphysis and facing of the articular surface inward toward the ulna.

Ulna.—Upper extremity with olecranon enlarged. Shaft slightly bowed inward and backward and thickened but fairly regular in outline. Lower extremity enlarged and irregular. Local enlargement just above the head. Head under-developed, styloid over-developed.

Elbow joint.—About normal except for the bone irregularities and enlargements.

Carpals.—All present but irregular in their distribution and size. The os magnum is much too large in proportion with the others.

Metacarpals.—Regular in arrangement but heads and bases are over-developed giving increased size. All are short and thick.

Phalanges.—Short and stubby but regular in arrangement and outline. Bases in particular are over-large.

Pelvis.—Ilia are about normal. Pubes and ischia fully developed but very small and far out of proportion with the ilia. Acetabula about normal.

Femora.—Short. Left which is shorter than the right is slightly bowed outward. Upper extremity of the right well developed except for the head and neck which are practically absent. Head and neck of the left totally absent. Lower extremities irregular; condyles poorly developed.

Tibiae.—Short but not bowed. Slight enlargement backward at the middle. Right, outer condyle much enlarged, inner somewhat so. Whole lower extremity enlarged laterally, especially the internal malleolus. Left, upper extremity enlarged, especially the outer condyle. Shaft short but regular. Lower extremity enlarged laterally especially the internal condyle.

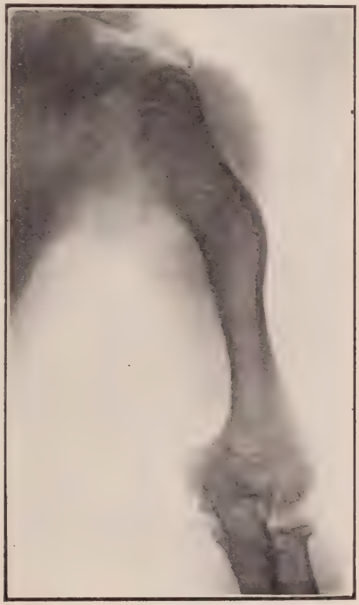

Fig. 6. M. E. Achondroplasia. Same case as figures 4 and 5. Radiograph of upper part of left arm. Note the short and greatly thickened humerus, which is sharply curved outward and most thickened above the middle. Note also the absence of the head, the great development of the lower extremity and the irregularity of the condyles. Note the exostosis on the upper and outer portion of the acromion process.

Knee joint.—Articular surfaces regular and in apposition.

Fibula.—About normal in development. Lower extremity extends 1 to 1½ inches below the tibial lower margin.

Tarsals.—Astragalus irregular in size and outline. Remaining tarsals not much affected.

Metatarsals.—Short and thick with enlarged ends as in the metacarpals.

Phalanges.—Short and thick with enlarged ends as in the phalanges of the hands.

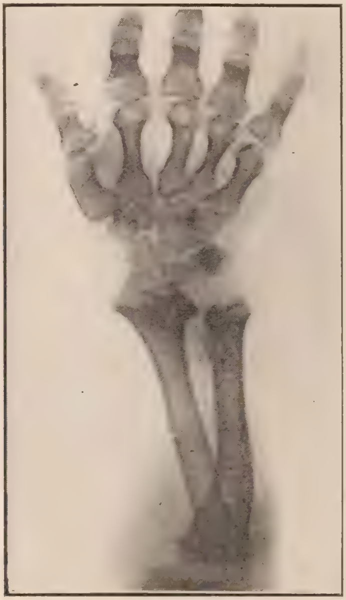

FIG. 7. M. E. Achondroplasia. Note the greatly shortened bones of the forearm, the radius whose shaft is slightly irregular, and whose head is greatly enlarged and irregular. Note the great enlargement of the lower end of the radius, with the facing of the articular surface inward toward the ulna. The shaft of the latter is thickened and bowed, its cortex is of uneven thickness, its upper and lower extremities are enlarged and irregular. Note the over-development of the styloid process, the irregularity of the carpals, the shortened and thickened metacarpals, with overdeveloped heads and bases and the shortened and thickened phalanges with overdevelopment particularly of their bases.

The most important points in this radiographic study are the shortening and deformity of the diaphyses, with irregular formation of the bony substance and the greater thickening of the cortex at the middle with thinning out toward the epiphyses; the greatly and abruptly enlarged ends of the shafts and the enlarged and distorted epiphyses, and in some instances the complete absence of the normal articular surface; the deficient ossification of the anterior portion of the ribs, the deficient ossification of the posterior portion of the left rib, and the presence of symmetrical exostoses on the bones of the upper extremity. These findings are in close agreement with those recently reported by Fussell and Pancoast of Philadelphia. Similar findings have also been reported by Bullard and George of Boston, who also note that near the epiphyseal ends the diaphyses become cup-shaped.

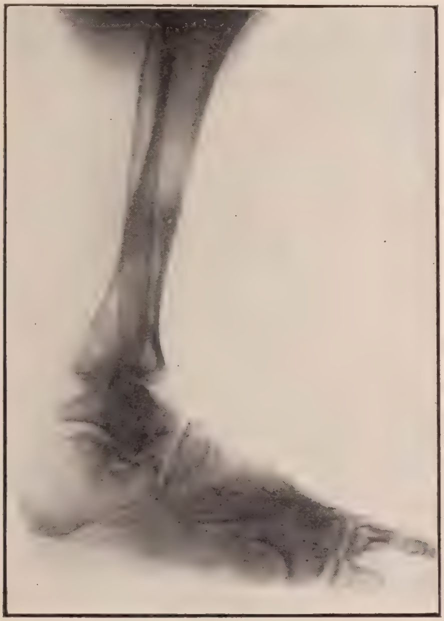

Fig. 8. M. E. Achondroplasia. Radiograph of right leg below knee. Note the great distance to which the lower end of the fibula extends below the lower tibial margin, also the irregularity in size and shape of the astragalus.

Apart from the changes in the bony, cartilaginous, and ligamentous skeleton, this patient presents no deviation from the normal. The thoracic and abdominal viscera, the skin, the nervous system, the blood and the excreta show nothing unusual. There is no absence of the thyroid. During the short time that he has been under observation neither thyroid extract nor pituitary has had any effect upon his growth or general condition.

Every pediatric clinic reports its cases of sporadic cretinism, and of its miraculous results in their treatment. In the elegant diction of Osler,[8] "not the magic wand of Prospero, or the brave kiss of the daughter of Hippocrates ever effected such a change as that which we are now enabled to make in these unfortunate victims, doomed heretofore to live in hopeless imbecility, an unspeakable affliction to their parents and to their relatives." In spite of the numerous cases of sporadic cretinism so far reported, and the marvelous results obtained by means of thyroid therapy, there is a great deal yet to be learned about the disease, particularly those forms of partial or abortive cretinism, denominated by the French writers as the "formes frustes." The following case is one of the complete type:

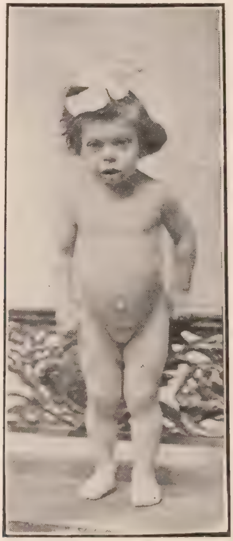

Fig. 9. E. G. Sporadic cretinism. Age 13 years. Note stunted growth, facial expression, open mouth with protruding tongue, puffy lower eyelids, depressed root of nose, and prognathism.

E. G. (Figs. 9, 10, 11), was 13 years old March 15, 1909. Her maternal grandfather died of tuberculosis at the age of 55. There is no history of rheumatism, syphilis, insanity or of other nervous disease or of goitre, cretinism or myxedema in the family. Her parents are natives of Western Russia, Hebrews, and in good health. The mother has borne seven children and has had no miscarriages. Five of the children were normal. The eldest child, a boy, now 15 years old, was born with a peculiar deformity: the right arm appeared as if it had been amputated just below the elbow joint, and on the stump were five small, soft, fleshy knobs looking like rudimentary fingers. E. G. was the second child. The third child died of diphtheria at the age of 6 months. The remaining four children are all living and in good health; they are respectively, a girl 9 years, a boy 7 years, a girl 4 years, and a boy 2 years old.

E. G. was born after a normal non-instrumental labor. Her appearance at birth was not that of a normal infant. She was jaundiced, and her tongue was large and protruded from her mouth. She was breast-fed until 18 months old, and began to walk and to cut her first teeth at 15 months.

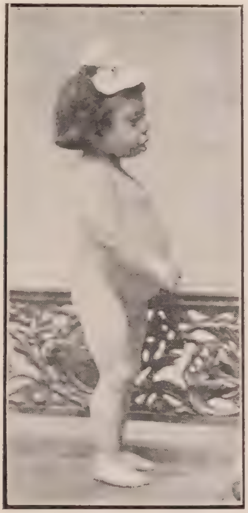

Fig. 10. E. G. Same case as in Fig. 9. Note the broad hands and feet, the puffy, wrinkled skin and the slight umbilical hernia.

As an infant she was markedly undersized and mentally deficient. The anterior fontanelle remained patent until the third year of life. It is remarkable that she contracted none of the infectious diseases of childhood, although she was exposed with other children in the family who had scarlet fever, measles, and diphtheria. When six years old she was treated for one month at the New York Post Graduate Medical School Hospital, with no appreciable improvement. Previous to that time and for the following 7 years she had no treatment. In May of this year, she developed mastoiditis following an acute suppurative otitis media and was operated upon at the German Hospital of Brooklyn. While convalescing at this institution, she was placed under thyroid treatment, which was continued for 3 or 4 weeks. It was noticed that while this treatment was being given, the child was less lethargic and her skin less dry. Apart from this slight temporary improvement, she has made very little progress since she was three years old. She still retains all of her milk teeth, with the exception of the lower central incisors, which were replaced only last winter by those of the permanent set. She continues to exhibit pronounced physical and mental lethargy. She has the ways of a child less than three years old, and will sit around the house all day, evincing interest in nothing, although she understands a good deal of what is said to her concerning the things of the house. She talks with a peculiar hoarse intonation, is

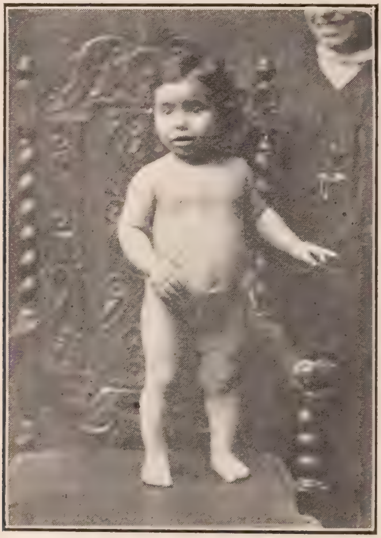

Fig. 11. E. G. Same case as in figures 9 and 10. Note the prognathism, the pendulous abdomen and the lumbar lordosis.

easily frightened, is very sensitive to the cold, and most of the time has cold extremities. Her appetite is habitually poor and she is generally constipated. She has not grown in height since she was three years old.

Physical examination shows a child appearing no more than two and a half to three years of age, with the characteristic appearance of a cretin: a dwarfed but well formed body, a physiognomy with an idiotic expression, thick lips, open mouth, large protruding tongue, eyelids thick and puffy, and skin pale, dry and edematous. The hair on the head is fairly abundant, light brown in color, and dry. The head is symmetrical, rounded, 50.5 cm. (19⅞ inches) in circumference, the fontanelles are closed, and the forehead is slightly bulging. There are 20 teeth in good condition, all of the primary set with the exception of the two lower central incisors. The tongue is long and thick, but smooth, the palatal arch is not exaggerated and the tonsils are not hypertrophied. There is no evidence of adenoids. The body weight is 16.36 kilograms (36 pounds), the height 83 cm. (32⅝ inches), the circumference of the skull is 51½ cm. (20¼ inches), and of the abdomen 54 cm. (21¼ inches). The configuration of the trunk is characteristic. The neck is short and thick, the thyroid can not be palpated. The spinal column presents a marked lumbar lordosis which partly accounts for the pendulous abdomen. The thoracic position of the spine presents a marked vertical groove occasioned by the existence of a pad of fatty tissue running vertically on each side of the vertebral column. The chest is symmetrical 51.5 cm. (20¼ inches) in circumference, and the mammae are not developed. The lungs are normal. The heart rate is 120, regular and strong. There is no evidence of a persistent thymus. The abdomen is protuberant, its circumference is 54 cm. (21¼ inches); there is a small umbilical hernia. Liver and spleen are not enlarged. The external genitals are those of a younger child, but there is a small amount of light hair on the mons veneris. The lower extremities are equal, 40.5 cm. (16 inches) long, and the feet are markedly broad and thick. The hands are also broad and thick, and show the hypertrophy of the hypothenar eminence which was first pointed out by Koplik as characteristic of the hands of cretins (Fig. 12). Hands and feet are cold and get blue upon exposure. The reflexes, both superficial and deep, are normal. There is moderate exophthalmos, the eyelids are thick, edematous and congested, the retina is normal, and the sight is good. Taste and smell are normal. The skin is dry, cool and puffy, but does not pit on pressure, the cutaneous sensibility to contact, sharp and dull points, heat and cold is sluggish. Voluntary reaction time is delayed. The muscles are flabby. The chief measurements compared with those of a normal child of her age are as follows:

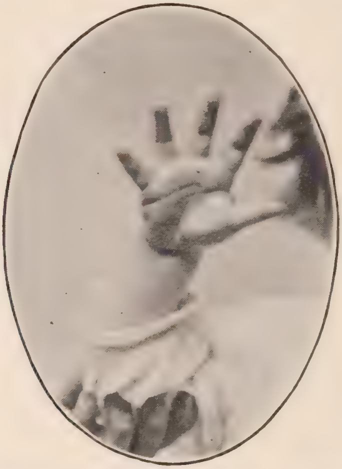

Fig. 12. Same case as in figures 9 to 11. Note the hypertrophied hypothenar eminence of hand, first pointed out by Dr. Henry Koplik as characteristic of these cases. The hand is just as thick on its ulnar as on its radial side.

	Weight.	Height.	Head.	Chest.
E. G.	16.36 kilos.	83. cm.	50.5 cm.	51.5 cm.
	36. lbs.	32.6 in.	19.8 in.	20.2 in.
Normal girl of 13..	41.36 kilos.	149.2 cm.	53.8 cm.	71.3 cm.
	91.2 lbs.	58.7 in.	21.2 in.	28. in.

Her weight corresponds to that of a girl 4 years old, her height to that of a girl 2 years old, her head to that of a girl 4 years old, and her chest to that of a girl 3½ years old. It is remarkable that this case has lived in the large medical center of New York since her birth and has received treatment extending only over a total period of two months. There are many of these cases in our large cities; they are hidden mostly in the dark rooms of the tenements where they live their sluggish and vegetative life. In most cases, treatment if ever begun, is not faithfully continued. E. G. is now taking two grains of desiccated thyroid three times a day. The result is as one would expect. The child has more animation, her face is taking on an intelligent expression, she is more interested in her surroundings, her appetite is better and she is less sensitive to the cold. During two months of treatment she has gained in height 2 cm. (¾ inch).

The diagnosis of a typical case of sporadic cretinism is not difficult, but this is not so with the atypical forms, or abortive or partial varieties of the disease. It may be recalled that Dieterle refers in his classification to two types of sporadic cretinism, as follows: congenital myxedema, of which E. G. is an example, in which the infant is born with a defect in the thyroid, and presents at birth the characteristic lesions of cretinism; and infantile myxedema, arising in an infant previously healthy, and resulting from some acquired injury or disease of the thyroid. Of the latter type the following case is a splendid example. The history is incomplete and is given very briefly.

F. C., a girl 3 years and 9 months old, was first seen by me Jan. 4, 1908. The mother is healthy and has one other child 2 years old and in good health. There is no history of syphilis, the father has occasional attacks of rheumatism, and the paternal grandfather died of tuberculosis. The infant was born after an instrumental labor; there were no injuries of the head, and there was no delay in primary respirations. It looked like a normal infant, and developed as such. It was fed at the breast until 13 months old, and cut its first teeth at the ninth month. A photograph taken when the infant was one year old represents a healthy, bright and well-formed child. She began to walk when 15 months old. When two years old she ceased growing, although she continued to develop somewhat mentally. At that time she weighed 26 pounds, which is the normal weight for a two year old child. Now, nearly two years later, she wears the same size clothing, and a shoe only one size larger. Ever since she ceased growing her appetite has been poor, and her bowels badly constipated. For the past ten months it has been noticed that her hands and feet are continually cold, and the lips would frequently get blue and remain so for two hours. Her hair which is always quite dry does not grow.

Physical examination reveals a child (Fig. 13) showing the typical features of myxedema. She weighs 12.95 kilograms (28.5 pounds), the normal girl of her age weighing 33 pounds. Her height, like her weight, is that of a two year old child, being 82 cm. (32¼ inches). The normal height for a girl of her age is 94 cm. (37 inches). The facial expression is that of a cretin; prognathism is evident, the eyes are wide apart, the bridge of the nose is depressed and the mouth is open. The limbs are short and thick, the abdomen pendulous, and the skin dry, wrinkled and edematous. A remarkable change had come over the child, as seen by contrasting the two pictures. A short course of thyroid treatment produced a decided improvement,

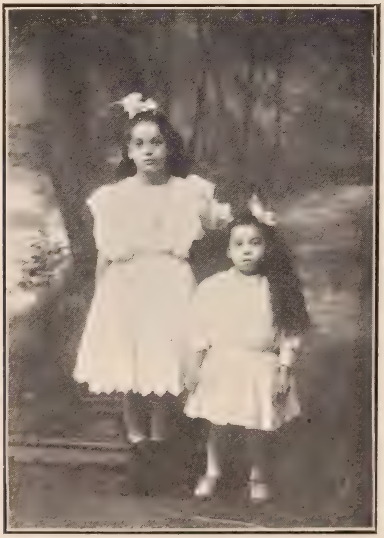

Fig. 13. F. C. 3 years and 9 months old. Shows the appearance of the child after the condition of myxedema has developed. The child has most of the characteristics of a cretin.

increasing the height and weight, improving the appetite, the condition of the skin and circulation, and changing the facial expression.

The abortive types of cretinism, the so-called "formes frustes" of the French writers, are still more difficult of recognition than the cases of infantile myxedema. They usually show only a few of the symptoms of thyroid deficiency, for this is presumably only partial. There may be merely an arrested growth, while in other respects the child is perfectly normal. These cases are not uncommon, and the need of their recognition is important, for thyroid therapy is exceedingly efficacious in these cases. The following is a good illustration of this form of infantile myxedema, or as it is sometimes called, myxedematous infantilism.

B. K. was first seen by me Feb. 2, 1909. She was 10 years old, born in this country, the oldest child in a family of four children, all of whom, with the exception of the patient, are in normal health. The parents are Russian Hebrews; the father is subject to slight digestive disturbances. There is no family history of insanity or other neurosis, syphilis, tuberculosis, alcoholism, rheumatism or consanguinity. The patient was born at term after a normal, non-instrumental labor, was breast fed, and passed through an uneventful infancy, except for the fact that dentition was delayed, the first tooth appearing at the age of 18 months. She was like a normal infant and child until the fourth year, when she stopped growing. She continued to develop in other respects. When six years old she began to go to school, and although her intelligence is a little below that of the average girl of her age, she has progressed fairly well in her school-work and is now in the 5th primary grade. Her sister who is one year younger, is one grade higher in school. The accompanying is a photograph of both children taken one month ago (Fig. 14). B. K. is the smaller child to the right. When six years old she had measles, and has had no other ailment, although her appetite is somewhat capricious. The only treatment she has ever had for her stunted growth was given at the Vanderbilt Clinic three years ago during a period of three months, when she visited the Clinic only three times. This treatment had no noticeable effect.

Physical examination shows a not unintelligent looking child, whose height 92 cm. (36⅛ inches), and weight 15 kilograms (33 pounds), correspond to those of a girl about 3½ years old. She is of dark complexion, her skin is dry and slightly myxedematous, and her hair is dark, coarse and abundant on the head and body. Her physiognomy presents a moderate degree of prognathism, her head is symmetrical and the fontanelles are closed, the bridge of the nose is slightly depressed, the teeth are in fair condition and the permanent incisors have erupted. Tonsils are not enlarged, and there is a suggestion of adenoids. The tongue is not enlarged or fissured. No evidence of the thyroid can be palpated. The deficiency of the thyroid can be clearly demonstrated in this case by the ability to distinctly feel the cartilaginous rings of the trachea, as far down as the suprasternal notch. This is in striking contrast to her younger sister in whom the trachea cannot be distinctly palpated. Heart and lungs are normal. Liver and spleen are not enlarged. The blood and excreta show nothing unusual.

The patient was given at first, one-half grain of desiccated thyroid three times a day, which was aftewards increased gradually to one and a half grains three times a day. During the first month there was no increase in height and the weight fell from 33 pounds to 31½ pounds. Then there was a slight steady increment in height, until at the end of four months the patient was 5½ cm. (2⅛ inches) taller and her weight had risen to 15.9 kilos. (35 pounds). During the next two months treatment was discontinued, and the height and weight remained stationary. The resumption of treatment, recently begun, is again producing its good effect upon the height and weight.

There is no doubt a close relationship between sporadic cretinism and the endemic form. Both types of disease are associated with a defective thyroid development. But the mode of this association and the original cause of the defect in the thyroid secretion are still subject to considerable speculation. The most recent contribution to this topic is that which has been made by

R. McCarrison,[9] who, as the result of an analysis of 203 cases of endemic cretinism occurring among the population of the Chitral and Gilgit valleys, came to the following conclusions: "The degree to which cretinism is associated with goitre is determined by the age of the endemic, and varies directly with the extent to which the latter disease prevails among the adult population. Cretinism is rarely, if ever, due to the development of a goitre in the individual. The thyroid enlargement is, or may be, an effect, it is not the cause of the disease. Defective thyroid function in the mother is the essential factor in the production of cretinism. Cretinism is due to the action of toxic agents, notably that of endemic goitre, on the developing thyroid of the unborn child. The thyroid defect is congenital, but it may remain latent, pending its manifestation through the impulse of some accidental circumstance. The defect in cretinism is one of the whole thyroid mechanism, the parathyroids, as well as of the thyroid gland. The diversity of symptoms is due to the extent to which the defect bears on the whole or part of that mechanism."

There can be little opportunity for error, if one bears in mind the classical features of the disease, as outlined in the cases reported in this paper, in differentiating between sporadic cretinism and achondroplasia. Early cases of the latter, however, may easily be mistaken either for rickets or for inherited syphilis, particularly in cases in which these diseases may co-exist with an achondroplasia. This is also to be distinguished from osteogenesis imperfecta, which is a disease of the periosteum and bony tissue, characterized by imperfect development of the bones, particularly in their ossification, and therefore an excessive fragility resulting in frequent fractures.

Considerable confusion has arisen in the nomenclature of the dwarfing diseases, by including many unrelated forms under the generic term, infantilism. This designation should, however, be reserved for a special group of cases. Tandler[10] refers to forms of infantilism proper, namely, infantilism partialis and infantilism universalis. The former comprises all those cases of arrested development that concern a particular tissue or organ, e. g., a patent foramen ovale, a persistent ductus botalli, cryptorchism, etc. Infantilism universalis, on the other hand, is that type of arrested development in which the stature is dwarfed, but in which the different parts of the body are normally proportioned, and in which the development is otherwise normal, except for the absence of the secondary sexual characteristics. This form of infantilism corresponds to what the French writers refer to as infantilism of the type of Lorain, which they distinguish from infantilism of the type of Brissaud, or myxedematous infantilism. This latter type, which has already been described in the course of this paper, in the case of F. C., (Fig. 13), results from thyroid insufficiency that develops during childhood either post-operative or as the result of an acute thyroiditis complicating typhoid fever, scarlet fever, rheumatism and pneumonia. Myxedematous infantilism presents all the well-known characteristics of myxedema in the adult. Excepting the dwarfed stature, this form of disease has nothing in common with infantilism of the type of Lorain, which in its causation has a great many etiological factors as follows: the infections of tuberculosis, syphilis, chronic malaria, rheumatism, erysipelas, influenza, measles, scarlet fever, leprosy and diphtheria; the chronic intoxications with alcohol, lead, mercury, nicotine and morphine; and the cardiovascular affections, such as mitral disease, persistence of the ductus botalli, and underdevelopment of the arterial system.

It may be possible to confuse cretinism with certain other forms of congenital idiocy that may or may not be closely related to it. Mongolian idiocy bears certain traits in common with sporadic cretinism, such as dwarfed stature and imbecility, but it may be sharply differentiated from the latter by the presence in mongolian idiocy of the characteristic eyes, the palpebral fissures slanting downward and inward, a high forehead, a fissured tongue, and by the fact that in this condition the thyroid treatment is of no avail. There are still other forms of congenital idiocy that cannot be classified with either of these diseases and that present dwarfism as one of their marked characteristics.

A little over one year ago, Prof. Christian A. Herter[11] described cases of infantilism presenting a definite symptom complex and attributed by him to chronic intestinal infection. The symptoms of this type are arrested bodily development with slight mental retardation; marked abdominal distention without perceptible enlargement of the spleen; a mild degree of secondary anemia; pronounced bodily and mental fatigue following slight exertion and intestinal disturbances associated with repeated attacks of diarrhoea and with diminution in the power of absorption. From the feces of these patients there was isolated, with several variants, a bacillus known as the *bacillus infantilis,* which presumably had some etiologic connection with the disease. There is an excess of indican and phenolic bodies in the urine, indolactic acid occurring in some cases and sometimes present in greatly excessive amounts. If there is a large amount of fat in the diet, the feces contain an excess of neutral fats, fatty acids and soaps. The excretion of these causes a marked loss of a calcium and magnesium to the body, which suggested a possible explanation of the retardation of the development of the skeleton. In February of this year, Arthur I. Kendall[12] working in Prof. Herter's laboratory, published the results of his careful experimental investigation of the bacillus infantilis and of its relation to infantilism. This spore-forming organism was isolated from each of a series of cases of infantilism, but it was also found in limited numbers in the feces of some, although not all normal infants. It is a saprophytic organism which under certain undetermined conditions finds a suitable environment in the intestinal tract and proliferates there. It produces no agglutinins and there is no direct evidence of its etiological relationship to infantilism. The experiments of Kendall also furnished evidence favoring the view that the diarrhoea observed in cases of infantilism is caused by irritant metabolic products resulting from the proliferation of bacillus infantilis in the intestinal tract.

Judging from the numerous contributions recently made to our knowledge of the disturbances of growth, it is apparent that this subject is emerging from the dense obscurity in which it has been veiled for such a long time. There is no subject in the broad field of clinical medicine more worthy of further investigation, or more promising in results of eminent practical value.

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623 Willoughby Avenue, Brooklyn.

THE ANNALS OF SURGERY COMPLETES ITS FIFTIETH VOLUME.—The December number of the *Annals of Surgery* (Philadelphia), which completes the fiftieth volume of that journal, is worthy of more than passing notice. It is a jubilee number, and, by its size and the character of its contents, fitly marks so important an event in its history. The cosmopolitan character of the journal is seen from the list of contributors, which comprises the leaders in surgery of England, Scotland, Denmark, France, Italy, Hawaii, Canada and the United States.

Twenty-two articles form a number of more than 400 pages. The illustrations, some of which are colored, are profuse, making a volume which merits the term of a jubilee number. Such an event in the history of any medical journal is worthy of note.

CEREBROSPINAL MENINGITIS, CLINICAL OBSERVATIONS, AND SERUM TREATMENT.*

By Louis Fischer, M. D.,

New York.

Attending Physician in Charge of the Babies' Wards of the Sydenham Hospital, and Attending Physician to the Willard Parker and Riverside Hospitals, etc.

The first authentic report of this disease in America dates back to 1806, in Massachusetts. Judging by the record of the mortality at no time has the epidemic appeared in such a severe type as in 1905-1906 in New York City.

Cerebrospinal meningitis was epidemic in New York in 1867-1868. It again appeared in New York in 1871-1872. The fulminating type predominated and existed among the negroes. This same epidemic continued until 1874, when it spread all over the United States. In 1876 the disease appeared sporadically and remained so until 1893, when a severe epidemic occurred. The disease again remained with us in its sporadic type until the severe epidemic, which occurred in 1905-1907. Since this time sporadic cases have appeared during the fall, winter, and spring months of the year.

In 1905, 2,775 cases were reported to the New York Board of Health. Sixty-seven per cent. of these cases occurred in children under ten years of age, and fifteen per cent. in infants under one year of age. A study of the statistics of the New York Board of Health is very interesting. While a large number of cerebrospinal meningitis cases are reported to the Board of Health, very many cases of a milder or abortive type are not reported. We have no compulsory registration of cases. Frequently cases are reported as simple spinal meningitis or tuberculous meningitis, which may or may not have been abnormal types of cerebrospinal meningitis.

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*Read by invitation before the Section on Pediatrics at the International Medical Congress, Budapest, Hungary, August 30, 1909.

In 1906, at the height of the epidemic, there were reported 1,032 cases, with 812 deaths, in greater New York. In 1907 there were 828 cases reported with 624 deaths. The mortality in 1906 was 78.7 per cent.; in 1907 it was 77.5 per cent. During six months of 1908 there were 253 cases reported with 182 deaths; the mortality was 71.9 per cent. We therefore find that the mortality averages between seventy and eighty per cent.

Climatic Conditions. During the severe epidemic of the two winters described, we had unusually cold weather. The precipitation of snow and the amount of frost and ice were far more than the average in our zone, for many years. With the exception of the two winters associated with this epidemic we had occasional spells of mild weather in the winter months, which permitted ventilation in the humblest homes. During such intense cold as characterized these winters, people will close windows and doors tightly, especially when fuel is expensive. The air in some of these houses is stifling, and especially among the ignorant it is impossible to persuade them to admit fresh air. Living in such unsanitary dwellings is certainly a factor in causing the general depression so commonly seen in the congested quarters of New York. A feature of dwellings in the tenement house district is the total absence of sunlight in the sleeping apartments. Direct sunlight never enters the sleeping apartments in many of the homes. I do not refer to an absence of light in some rooms, but I speak of the absence of sun rays. When an infectious disease such as cerebrospinal meningitis enters such congested homes, then the germ finds a favorable soil for its propagation and most especially for its dissemination.

Etiology. The presence of the diplococcus of Weichselbaum was usually the causative agent of this disease. In some cases a streptococcus, in others a pneumococcus has been found. Weichselbaum states that he believes the meningococcus is frequently present and lies dormant in the crypts of the tonsils and pharynx. For this reason he believes that when a lowered vitality exists due to subnormal conditions, then the meningococcus gains access through the lymph channels to the meninges and sets up an acute and sudden infection. In addition to the presence of the meningococcus in the tonsils, this pathogenic microbe is frequently found in the nose, from whence it probably gains access through the frontal sinuses and reaches the brain. The meningococcus can be transmitted and an infection disseminated by direct contact with infected secretions containing the diplococcus intracellularis. Weichselbaum does not believe that the sudden appearance of a case of cerebrospinal meningitis in an otherwise healthy location is extraordinary when the etiological conditions such as the possibility of harboring this diplococcus in the nose and throat is remembered.

Symptoms. During the epidemic there were three classes of cases encountered, first, a mild type; second, a severe type; and third, an abortive type.

Mild Type. In this class of cases there was a slight rise of temperature, generally malaise, and perhaps vomiting.

Abortive Type. This type is usually seen in strong children who are able to withstand a severe infection. By reason of their health they are infected in a lesser degree, as shown by their symptoms and the rapidity of their convalescence. The onset is usually sudden, and I have seen meningeal symptoms subside within ten days with no sequelæ. This happened in a case of a child with undoubted cerebrospinal meningitis, in which the diagnosis was confirmed by the bacteriological examination of the spinal fluid. Rhinitis with catarrhal discharge from the nose is sometimes an early symptom in this disease. Rhinitis is frequently found in the abortive type of the disease. The danger of having the meningococcus in the nose consists in the ease with which this pathogenic bacterium can enter the frontal sinus and thus give rise to encephalitis. In the abortive type of this disease there frequently is a nasal discharge in which the meningococcus intracellularis can be found long after the rhinitis has disappeared. The ambulatory cases are the ones which disseminate this infection because they carry the pathogenic bacteria from house to house.

Severe Type. In the severe type there is a sudden onset of symptoms. In older children a distinct chill is usually the first symptom noted. The skin feels hot. The temperature rises anywhere between 102-105° F. (38.8 and 40.6° C.), in the rectum. The pulse varies, it may be slow or very rapid. The respiration is irregular in character, sometimes sighing, and labored, but most frequently Cheyne-Stokes in character. Later on there is vomiting, pain in the head, in the frontal or occipital regions, and pain at the back of the neck. There is moaning and frequently delirium. Vasomotor disturbances, such as the flushing of one ear or one cheek, are occasionally seen. The *tache cérébrale* is usually noted when stroking the breast with the finger nail, as a distinct hyperæmia follows and remains for several minutes. The tendons are very sensitive to the slightest pressure. The patellar reflexes are usually absent. When the thigh is flexed on the abdomen and we try to extend the leg there is considerable latent contraction, the so-called Kernig's sign. This symptom alone should not be depended upon. Hyperextension of the big toe produced by stroking the sole of the foot, the so-called Babinski reflex, is not always present. It is also frequently noted in perfectly healthy children. In a series of fifty children examined by me, the Babinski reflex was found in forty.

Either constipation or diarrhæa may be present. The bladder acts well, although enuresis may exist. In some cases there is a marked retention of urine. The joints are usually swollen, simulating rheumatism. There is also a distinct petechial eruption in some cases. Out of a series of twenty-two cases seen by me, six had distinct petechia. In six others the skin had a distinct eruption resembling scarlet fever. Owing to the spots present in this condition, the disease was frequently termed "spotted fever." The pupils are usually dilated, they are sometimes irregular. I have seen cases during the epidemic of 1905 in which one pupil showed marked dilatation, while the other pupil was contracted to almost a pinpoint. Strabismus is a frequent symptom. Occasionally we note nystagmus. Photophobia is a frequent symptom. In one of my cases the child cried whenever a lighted candle was brought near the eyes. Opisthotonos is usually present. The severe rigidity of the sternocleidomastoid muscle in addition to the marked rigidity of the arms and legs forms a very prominent symptom during the course of the disease. Owing to these severe contractures we usually note constant moaning, most likely induced by the pain caused by the said contractions.

Diagnosis. The diagnosis as a rule is easily made. The sudden onset of meningeal symptoms associated with vomiting suggests scarlet fever. The examination of the throat shows an absence of patches, the so-called scarlatinal diphtheria or scarlatinal necrosis. The tongue is usually coated, but has not the strawberry appearance so common in scarlet.

A positive diagnosis of this disease can be made by examining the fluid drawn by lumbar puncture. As a rule the spinal fluid is turbid or opaque. We do not find the spinal fluid clear and transparent, as it is seen in tuberculous meningitis. The presence of the characteristic diplococcus intracellularis described by Weichselbaum is always present. In rare cases the streptococcus and the pneumococcus have been found, but these latter are the exception. The bacteriological diagnosis according to Weichselbaum depends on the diplococcus being Gram negative, or decolorized by Gram. It is important to remember that the *Micrococcus catarrhalis* is frequently found in the nasal passage, hence great care must be exercised to differentiate the same, both in its relation to Gram staining and also in its morphological characters.

In order to judge of the type and severity of cases seen in New York City, I shall describe three cases which were admitted to my service at the babies' wards of the Sydenham Hospital. All three cases occurred during the past winter, 1908-1909, and all of the patients were under one year of age, seven weeks, four months, and eleven months respectively.

Case 1.—Rubin G., seven weeks old, was admitted to my service at the Sydenham Hospital, November, 1908.

Family history. Grandmother on paternal side died of tuberculosis. The father had had a cough for the last four years, but no history of tuberculosis obtained. Mother living and well. Another child six years of age, living and well.

Personal history. Normally delivered infant; seven weeks old. Breast fed and nursed well. Past three weeks bowels were constipated, but stools were of yellowish color. Mother gave rectal injections daily. With the exception of an occasional vomit after feeding, the infant was perfectly well until the present illness.

Present history. Illness began three weeks ago (Oct. 10th) *when infant was four weeks old.* Mother noticed the infant became feverish and began to vomit after feeding. A few days later noticed retraction of the head and rigidity of the limbs. Infant was taken to Mt. Sinai dispensary and there, according to mother, was treated for stomach trouble. On the seventh day after onset, mother stated that fever subsided, but the retraction of head and vomiting persisted. The bowels were constipated since onset (three weeks). There was no cough. A few days before admission mother noticed a profuse discharge from one ear, and at the dispensary a paracentesis was done on the other ear. No history of malarial infection, no history of umbilical infection or nasopharyngeal trouble, and no instrumentation at birth. One day previous to admission infant had several convulsions.

Physical examination. General appearance.—Infant appeared well nourished, had good color, was very quiet when left alone; but cried lustily when palpated. Assumed an opisthotonos position. Head appeared normal in shape, veins were distended. There was marked bulging of anterior fontanelle. Examination of mouth and tongue was negative. Throat was clear, no evidence of retropharyngeal abscess. There was a purulent discharge from both ears. Neck, there was a marked rigidity of both sternocleidomastoid and trapezius muscles. The head was markedly retracted. Chest was normal in contour, symmetrical, good expansion, free respiratory movements on both sides. No sign of rickets. Heart was normal in size, no enlargement; good action, regular, rapid, no murmurs. Pulse regular, good quality, and not intermittent. Examination of the lungs was negative. Abdomen showed no rigidity, no masses, but presented hyperæsthesia on touch. The back was arched and its relation to head was that of opisthotonos. Spleen and liver were not palpable. The upper extremities were slightly rigid, lower ones markedly so. Kernig's sign was present on both sides. Knee jerks both exaggerated. No ankle clonus. Cremasteric reflex obtained. Genitals normal. There was no eruption on the skin, no ecchymosis. Tache cérébrale was marked. No enlargement of the glands. The eyes reacted sluggishly to light. Slight internal strabismus present in left eye.

Clinical Notes.—November 5th. Since day of admission infant had a temperature which ranged between 97° and 99.6° F. (36.2 and 37.6° C.), the highest being 100° F. (37.80° C.). The pulse was intermittent for the last three days. Opisthotonos more marked. There was projectile vomiting after feeding, and infant showed signs of emaciation.

November 3rd. Lumbar puncture resulted in dry tap.

November 4th. Lumbar puncture resulted in dry tap.

November 5th. Anterior fontanelle aspirated, 45 c.c. turbid fluid drawn off. Microscopical examination revealed many pus cells and meningococci (intracellular diplococci) *negative* to Gram. General condition of infant worse than that on admission. Opisthotonos increased.

November 6th. Lumbar puncture resulted in dry tap. Opisthotonos and retraction of head still marked. Projectile vomiting after feeding. Lost one pound in weight since admission. Slight external strabismus of right eye present. Temperature to-day ranged between 99.6° and 100.2° F. (37.8° C.). Pulse regular, rapid, and of fairly good force. Respirations rapid and somewhat irregular. Forty-five c.c. turbid fluid withdrawn through anterior fontanelle, and 30 c.c. serum injected.

Dr. Flexner saw this case with me at the hospital and suggested washing the purulent discharge through the anterior fontanelle. This was done by using a long aspirating needle, the calibre of which was somewhat larger than the needle ordinarily employed to do lumbar puncture. The intracranial cavity was aspirated and as much fluid as possible drained off (from 30 to 50 c.c.). The cavity was then washed with normal salt solution, and lastly from 30 to 50 c.c. Flexner serum was injected.

November 7th. Twenty c.c. fluid withdrawn through anterior fontanelle, and 30 c.c. serum injected.

November 9th.—Lumbar puncture resulted in turbid fluid mixed with blood. About 10 c.c. of the serum was injected into the spinal canal, and 20 c.c. into the anterior fontanelle, the latter injection was preceded by the aspiration of 40 c.c. turbid fluid somewhat reddish in character, and containing heavy deposit of pus cells. Smear showed typical meningococcus.

November 10th. Lumbar puncture resulted in dry tap. Fontanelle aspirated, 10 c.c., purulent fluid withdrawn. Twenty c.c. serum injected through anterior fontanelle. Smear showed typical meningococcus.

November 11th. Forty c.c. fluid withdrawn through anterior fontanelle. Fluid was turbid, and somewhat bloody. Contained much pus. Typical meningococcus found in smear. Twenty-five c.c. serum injected through anterior fontanelle.

The child showed renewed strength after each injection of serum, so that it appeared to exert a decided benefit. The rapidity with which these cases terminate fatally, and the fact that this infant was sick, in all, thirty-seven days gave me hope for his recovery. The case terminated fatally.

Case II.—Emilio G., four months old, was admitted to the Sydenham Hospital, January 6, 1909. Family history negative.

Personal history. Normal delivery. Full term. Fed since birth on Straus's milk.

Present illness began two weeks ago with twitchings of the muscles. One week ago mother noticed retraction of the head. There had been no vomiting. The baby had moaned almost constantly.

Physical examination. Head showed bald occiput. The anterior fontanelle was open and slightly bulging. The pupils were equal and slightly contracted. There was marked retraction of the head, amounting to episthotonos. The chest showed poor expansion. There was a systolic murmur heard at the apex of the heart. The lungs over left base, posteriorly, showed small areas of dullness, bronchial voice, and breathing. The abdomen was retracted. The liver and spleen were not palpable.

There was marked rigidity of both arms and legs. The reflexes were exaggerated. Kernig's sign was not elicited. Lumbar puncture showed turbid fluid in which the *Diplococcus intracellularis* was found.

The duration of the disease was thirty-six days. By means of ten lumbar punctures, I aspirated 146 c.c. spinal fluid, and in nine intraspinal injections, I injected 245 c.c. Flexner serum. The average injection was about 30 c.c. The child made a complete recovery without any sequelæ.

BLOOD COUNT IN CASE II.

	White blood corpuscles.	Polynuclear leucocytes.	Lymphocytes.	White blood corpuscles.	Polynuclear leucocytes.	Lymphocytes.
	Before injection.			After injection.		
Jan. 7	.....	....	....	17,200	74%	26%
Jan. 8	15,800	68%	34%	13,400	64%	36%
Jan. 9	12,500	66%	34%	14,200	70%	30%
Jan. 11	12,300	56%	44%	15,400	65%	35%
Jan. 13	13,600	66%	34%	14,100	70%	30%
Jan. 15	17,800	75%	25%	13,200	68%	32%
Jan. 16	11,500	70%	30%	13,400	73%	27%
Jan. 18	11,500	72%	38%	13,400	73%	27%
Jan. 20	17,800	79%	21%	17,800	79%	21%
Jan. 22	17,800	74%	26%	17,800	79%	21%

Case III.—Hannah R., eleven months old, was admitted to the Sydenham Hospital, March 2, 1909. The father was insane, otherwise the family history was negative. She was a full term child. Normal birth. Breast fed, but supplemented by bottle feeding. Had no diseases of infancy. Present illness began one week ago with fever and chills. Vomited once four days ago. Had no convulsions or twitchings, no rigidity noticed by mother. No coma, no diarrhœa. It seemed to mother that infant could not see. On admission to hospital the infant was in semistupor, and slight general rigidity.

Physical examination showed internal strabismus of the right eye, pupils did not react to light. Purulent discharge from both eyes. The tongue was coated, the pharynx congested and studded with granules. The neck was rigid, no glands palpable. The breathing was Cheyne-Stokes. The pulse was rapid and irregular, systolic murmur at apex not transmitted. Rhonci were heard all over the chest, especially over right apex. The abdomen was not distended, nor were any masses felt. The liver and spleen were not palpable. Kernig's sign was absent. *Tache cérébrale* was present. The prognosis was bad.

Clinical notes. March 2d, at 7 p. m., on day of admission, 5 c.c. turbid fluid was withdrawn by lumbar puncture. At the same time 15 c.c serum was injected into the spinal canal. Examination of the fluid withdrawn showed the presence of meningococci, few in number, with very numerous pus cells. A film separated after the fluid stood for some time. The blood count that night showed: White blood corpuscles, 18,000; polynuclear leucocytes, sixty-four per cent.; lymphocytes, thirty-four per cent.

March 3rd, at 4 p. m. ten c.c. of turbid fluid was withdrawn and 20 c.c. serum injected. Following this injection the child appeared to suffer from shock. Respiration became slow, deep, and labored. Pulse was slow and of high tension. One hour later twitchings of the right side of the face were noted. Between 6 and 11 p. m. there were twitchings of the right hand and foot. Examination of the fluid revealed a diminished number of pus cells, many of which were disintegrated. Meningococci were not found.

March 4th. Pupils were unequal, the right being larger. Slight facial palsy noted on right side. The blood count showed white blood corpuscles, 15,200; polynuclear leucocytes, sixty-eight per cent.; lymphocytes, thirty-two per cent.

March 5th. Pupils equal. Strabismus had disappeared.

March 6th. Child looked better, very little rigidity present. Slight facial palsy, right side.

March 9th. Child had developed a spasmodic cough, resembling pertussis.

March 10th. No rigidity. No facial paralysis. Blood count showed: White blood corpuscles, 21,300; polynuclear leucocytes, thirty-eight per cent.; lymphocytes, sixty-two per cent.

March 14th. A lumbar puncture was made and 5 c.c. of clear fluid was withdrawn. No bacteria or pus cells found. The blood count showed: White blood corpuscles, 24,200; polynuclear leucocytes, forty-four per cent.; lymphocytes, fifty-six per cent. The infant showed evidences of deafness in both ears. The high white corpuscles count and the relative lymphocytosis were attributed to the cough.

March 21st. The infant was discharged cured.

A decided reaction followed each and every injection of the serum. The pulse rate was increased, the volume improved, and the tension much higher. The leucocytes were invariably increased, with but few exceptions, showing a marked hyperleucocytosis. The polynuclear leucocytes were also increased after each injection. As a rule the mononuclear leucocytes and the lymphocytes were reduced within six hours after the serum injection. The prognosis, although bad in all cases, seemed to improve because two of the infants received maternal feeding. The third case received artificial feeding of cow's milk.

Special Symptoms noted during the epidemic. Convulsions. —The earliest symptom in many cases is convulsions. Muscular rigidity confined to the muscles of the neck; chiefly sternocleidomastoid, also marked opisthotonos.

Extreme extension muscle rigidity. This rigidity is confined to the lower extremities in some, to the upper extremities in others. In some cases it was found in both. The patellar kneejerk while absent in some cases was greatly exaggerated in others. The fontanelle was bulging and associated therewith intracranial pressure existed. The patellar reflex was usually absent. The cremaster reflex was present in several cases. It was present in an infant less than one year old. The Kernig sign was present in all cases.

Muscular pains. Evidence of pain on the slightest handling was invariably present. The muscles, the joints, and the course of the sciatic nerve trunk elicited pain. Rotation of the arm, and general handling of the abdomen showed marked hyperæsthesia. The plantar reflex was present in all cases. I have observed this symptom in the hospital service, in normal children. No importance therefore should be attached to this reflex.

The *tache cérébrale.* A strong *tache* appearing very slowly and lasting a long time, was present in all my cases. This *tache* differs markedly from the stroking of the skin in normal children.

Eruptions. An exanthematous eruption resembling herpes was found in ten per cent. of the cases. In seventy per cent., however, there was a petechial eruption resembling purpura. This rash was of a dark bluish color and might be seen as early as the second day of the disease. It lasted from one to two weeks in severe forms of the disease.

Delirium was noted in fifty per cent. of the cases.

High fever. As a rule most cases showed a tendency to high fever, though one exceptional case did not conform to this rule.

Vomiting. This is one of the earliest symptoms. Persistent vomiting with high fever and rigidity of the muscles in children wherein careful feeding methods were pursued, were invariably suspected of meningeal disease, and lumbar puncture performed to aid in making the diagnosis.

The joints showed swelling in several cases, resembling polyarthritis.

Facial paralysis was noted in fifty per cent. of the cases. It was a unilateral palsy. Some cases showed lagophthalmus. Deafness and blindness were noted in forty per cent. of the cases. The eye symptoms vary. In a report of forty cases with special reference to the eye symptoms, Randolph, quoted by Leszynsky (*Johns Hopkins Hospital Bulletin,* IV, 32, 1893), states that "patients with enormously dilated pupils died." Among 111 cases of cerebrospinal meningitis reported by Councilman, Mallory, and Wright (*Massachusetts State Board of Health Report,* 1898, p. 143) "various abnormal conditions of the eyes were noted in sixty-seven cases." They state that no systematic examination of the eyes was made in all cases. In one case "bulging of the eyes" was noted.

After a review of the literature we must conclude that the eye symptoms vary with the epidemic and the degree of infection.

Differential Diagnosis. This disease is frequently confounded with mastoiditis. A purulent otitis extending to the mastoid cells may frequently give symptoms of sternocleidomastoid rigidity with fever, pain, and constant moaning, but a lumbar puncture will show the absence of the specific diplococcus.

Scarlet fever of a severe type will frequently give rise to gastric and meningeal symptoms greatly resembling meningitis. In the septic form of scarlet fever there is stupor, somnolence, and moaning, but in scarlet fever we also have throat and tongue symptoms, in addition to the characteristic exanthem. In the atypical forms of scarlet fever in which there is no exanthem visible it may be very difficult to differentiate. The examination of the throat and the presence of necrotic pseudomembraneous patches will establish the diagnosis.

Septic pneumonia when confined to the apex of the lung will frequently irritate the cervical ganglion and give rise to symptoms of stupor, delirium, and rigidity of the sternomastoids. The presence of the pneumonia and the previous history of the case will aid in establishing the diagnosis of cerebral pneumonia and excluding cerebrospinal meningitis.

Since the diplococcus intracellularis has been isolated as the ætiological factor in cerebrospinal meningitis, many attempts have been made to produce a specific serum analogous to the healing serum of diphtheria. In Europe we have Jochmann, who has given us a serum for this purpose. Schöne, who tried Jochmann's serum in a series of cases, reports a mortality of twenty-eight per cent. In a series of cases treated without this serum, this same observer reports a mortality of fifty-three per cent. Wassermann in a series of fifty-seven cases reports a mortality of 47.3 per cent.

American Statistics.

Dr. Flexner was kind enough to give me the following statistics:

Cases of Epidemic Cerebrospinal Meningitis Treated with the Antimeningitis Serum.

Total No. of cases.	Recovered.	Died.	Per cent. mortality.
712	488	224	31.4

Analyzed According to Period of First Injection.
Period of Injection.

Period of Injection.	Recovered.	Died.	Per cent. mortality.
First to third day—	180	61	25.3
Fourth to seventh day—	179	69	27.8
Later than seventh day—	129	94	42.1

Specific Treatment with Flexner's Serum. The mortality of from sixty-nine to ninety per cent. in New York City, during the height of the epidemic in 1906, clearly shows that some better method of treatment than the one in vogue would be welcome. A large number of infants who died were treated by lumbar puncture and intraspinal injections of various drugs; cupping and antispasmodic and sedative treatment; locally, hot baths, in addition to leeches over the spine and mastoid, and ice-bags have been used with poor result. It remained for Simon Flexner to introduce the antimeningitis serum which has proved of excellent value, and in some instances acted like a specific healing serum in the treatment of this dreaded disease.

The literature both in America and in England has reported a series of several hundred cases treated by this antimeningitis serum. A very striking instance of improvement is described by Dunn, who reports that in the Boston Children's Hospital, from 1899 to 1907, before the serum was used, the mortality ranged from sixty-nine to eighty per cent. Since the spring of 1907, by the use of the serum the mortality sank below twenty per cent.

The greatest mortality has usually been noted in infants during the first year of life. Holt[1] describes a series of twenty cases under one year, treated in his wards, not one infant of which recovered. He further quotes a series of sixty-one cases, under two years of age, with fifty-five deaths, a mortality of ninety per cent. Koplik[2] states that of twenty-seven cases observed by him, twenty-three either died or were discharged unimproved.

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[1] Holt. Diseases of Infancy and Childhood, 1906, p. 763.

[2] Koplik. Osler's Modern Medicine, ii, p. 575, 1907.

In a series of seven cases treated at the New York Foundling Hospital during 1905, the mortality was 100 per cent.

Flexner reports a series of twenty-two cases treated with antimeningitis serum; there were eleven recoveries and eleven deaths. When it is noted that it is very rare for an infant to recover, then the striking benefits of the serum will be apparent. Another series of nineteen cases between the first and second year were treated with Flexner serum. Eleven infants recovered and eight died, mortality 42.1 per cent. In sixty-eight cases ranging between two and five years there were fifty-two recoveries and sixteen deaths, mortality 23.5 per cent. Flexner[3] states that out of 393 cases, 295 children, or seventy-five per cent., recovered, and 98 children, or twenty-five per cent., died.

In a series of twenty-one cases reported by me[4] there were fourteen deaths, without serum treatment. In one case death occurred twelve hours after the first symptom was noted. Other patients were comatose and lasted as long as fourteen days. A mortality of 66⅔ per cent.

In a series of ten cases treated with the antimeningitis serum there were seven recoveries and three deaths.

Holt, in a paper read before the Medical Society of the State of New York, January 26, 1909, describes the action of the serum as follows: "The serum acts chiefly upon the meningococci, diminishing their viability and increasing their capacity for phagocytosis. By its effect upon the microorganisms it arrests the inflammatory process. To accomplish this result the serum must be injected in considerable quantity; it must be brought directly into contact with these organisms, and in a certain degree of concentration. This enables one to understand why it is practically without effect when given subcutaneously or intravenously, also to appreciate the advantage of withdrawing by puncture as much cerebrospinal fluid as possible before the injections are made, and finally the necessity for full doses early, before important lesions have occurred."

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[3] Flexner. Journal of Experimental Medicine, September, 1908.

[4] Medical Record, August 13, 1904 .

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162 West Eighty-seventh Street.

SARCOMA OF KIDNEY—REPORT OF A CASE.

By Edward J. Wynkoop, M. D.,

Syracuse, New York.

The occurrence of malignant kidney disease in young children is rare, and cases that are brought to our attention should be placed on record.

On October 14, 1907, at the request of Dr. F. W. Slocum, of Camillus, I saw in consultation with him, H. C., female, age 2 years, 3 months. Family history negative, father, mother, and four children living and in good health. Three children had died in early infancy. The mother's mother had dropsy for 2 years and 8 months before death, her left eye was "pushed out" and became unduly prominent. Sight of left eye was lost at this time and 2 months before her death, sight of right eye was lost. There was no "pushing out" of right eye.

Baby was brought up on cow's milk, as mother was unable to nurse her. As far as could be ascertained child's development was normal. The child had never had any sickness or bowel disturbance. About three weeks before my visit the baby began having pains in the stomach, usually worse at night and generally irritable and acted as though she did not feel well. However, she would play around some during the day, and at times act quite well. About two weeks before my visit, the mother noticed that the baby's stomach began to enlarge and three or four days later stomach became prominent, left eye became more prominent and appeared to be pushed out. For the past week or ten days, child has not been able to walk around and has been steadily getting weaker, abdomen becoming larger and general condition worse. Appetite failed gradually, but no vomiting or bowel disturbance. For some days child had a slight cough, but temperature was never above normal.

Physical examination shows patient anaemic, considerably emaciated, left eye prominent, and abdomen badly distended, and superficial veins very prominent. It was impossible to outline any of the abdominal organs owing to the marked distension. Evidence of slight bronchitis also present. Urine showed slight trace of albumin. Temp. 99, P. 120, R. 34.

As the condition of the child was steadily growing worse, it was decided to send her to the Women's and Children's Hospital, and the following day she entered the hospital.

General condition was unchanged. Urine contained trace of albumin. Hyaline and granular casts and a few blood cells. Blood examination by Dr. Dutcher, showed haemoglobin, 70%, R. B. C. 4,148,000, W. B. C. 32,360. Oct. 18, haemoglobin, 60%, W. B. C. 11,300.

Differential count shows no pathological elements.

On the 16th temperature varied from 90° to 101°, P. 150.

On the 17th, temperature 102°, P. 160, R. 62.

On the 18th, temperature 103° to 104°, P. 174, R. 50.

Death occurred on that date.

Autopsy—Dr. Steensland, Oct. 19, 1907.

Anatomical Diagnosis.

Sarcoma of right kidney.

Metastasis; bilateral ovarian, subdural cranial, subperiostial orbital and periostial spinal, hydroperitoneum.

Microscopical diagnosis.

Malignant lymphoma. (Lympho sarcoma.)

While the child was a patient in the hospital, several of the attending staff saw her, and the possibility of malignant disease was considered. An X-Ray examination by Dr. Coon, showed a probable kidney tumor.

The examination of the eye discharges made on Oct. 18th, showed connective tissue forming alevoli, containing many round cells with deeply staining nucleus.

The great interest in the case centers in the rapidity with which the symptoms developed, and the autopsy findings.

From time to time cases of kidney sarcoma are reported in the pediatric journals and this is simply another one to swell the mortality.

Most authorities agree that all cases of kidney sarcoma are congenital and usually develop between 6 months and 4 years. The majority, however, develop under 2 years.

"Eberth was the first to demonstrate that the embryonal adenosarcoma takes its origin from remnants of the Wolffian body. These tumors always develop inside the kidney.

The kidney tissue proper, however, does not take part in the process, but becomes compressed and atrophied, as the tumor grows.

The characteristic symptoms of renal sarcoma are tumor, hematuria, pain and cachexia." (Carr.)

When this patient was first seen by Dr. Slocum, it was impossible to map out any tumor formation.

Not until the autopsy was it possible to arrive at an accurate diagnosis.

THE REDUCTION OF TEMPERATURE IN CHILDREN WITHOUT THE AID OF DRUGS.*

By W. C. Hollopeter, A. M., M. D.,

Professor of Pediatrics in the Medico-Chirurgical College; Pediatrist to the Medico-Chirurgical and Philadelphia Hospitals; Physician to St. Joseph's Hospital, Philadelphia,

and H. Brooker Mills, M. D.,

Lecturer on Pediatrics in the Medico-Chirurgical College; Assistant Pediatrist to the Medico-Chirurgical Hospital, Philadelphia.

Fever in children is truly a symptom-complex. Most frequently it is an exhibition of vasomotor unrest, and it may be, therefore, psychic or physical. In young children, under one year, the emotional element plays a most important rôle. The undeveloped cortex does not inhibit. All acute diseases in young children are therefore ushered in with more or less fever. This is always the leading clinical feature. The symptoms of acute disease, which in an adult are often restricted, chiefly to the organ or region primarily involved, tend, in children, to affect the patient as a whole. Thus we find that diseases develop general or constitutional symptoms more frequently and on less provocation than in adults; and the younger the child, the more striking is the contrast, and that in all of them localizing symptoms are less obvious. The clinical system complex that goes by the name of cerebral state, and comprises blurring of the mental faculties, drowsiness, delirium and coma, though not rare at any age, is induced most readily in the young. These signs are therefore of less importance in early life. Acute pneumonia, whether beginning with convulsions or not, may set up this cerebral state quite early in its course and before any localizing signs have developed in the lungs. In adults, on the other hand, such a condition does not, as a rule, arise until the disease is passing toward a fatal issue. If we were to state the attitude of children to acute disease, feverishness being the main feature, we would say that their equilibrium is shifting. They are easily overthrown but are as easily set up again. Their center of gravity is high in health and they are soon knocked down.

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*Read in the Section on Medicine, Medical Society of the State of Pennsylvania, Philadelphia Session, September 30, 1909.

The treatment of the sick with a minimum amount of medication in the shape of drugs is, perhaps, one of the most prominent and important evidences of the progress of medicine in the past decade, and in no branch of the science of medicine is this more apparent than in the treatment of diseases of children. There are so many drugs that their little systems cannot tolerate in a dose of a size that would have any therapeutic value and there are so few vehicles that do not have the drawback of either annihilating the value of the drug or nauseating the patient by their syrupy taste that the treatment of the diseases of childhood with a minimum amount of drug medication is no longer a matter of choice, but is really one of necessity. All acute diseases are accompanied by more or less fever, and this is especially marked in the early years of life.

The most satisfactory antipyretic used for young children is cold, but it also has its dangers. It may be used in the form of an ice bag or a sponge used cautiously. By means of the ice cap or sponging we are able to calm down a nervous irritability, and this is done by literally bleeding the children into their own vessels. The routine method that we follow in private, as well as hospital work, in managing the feverish child, is the manipulation of the ice cap and hot-water bag. The ice bag is placed to the head and the hot-water bag to the feet. Of course this has the effect of equalizing the circulation in the most satisfactory way. This is all preliminary to the sponging. We incline to supplement the ice bag and the hot-water bag if the child's temperature is not reduced in a few hours, by ordering cold sponging. This is accomplished by removing all of the clothing, except the diaper, and placing the child on a blanket and sponging for ten or twenty minutes. This will allay the nervous tension and reduce the temperature, and is more satisfactory than any anodyne, especially if done in a gentle manner by a person with a soft voice. In a fretful or nervous child it is well to commence with water at the temperature of 90° or 95° and sponge the body very carefully. Commence at the face and gradually go down the anatomy until the whole body has been covered, and then allow a little evaporation, or have the child exposed, except its extremities.

The second step is to take a basin containing water at 80° and proceed in the same way as at first, finally using a basin containing water at 70°. This method of procedure has been less trying to the child and favorable results are earlier reached. If the child is irritable or excitable, the whole body should not be exposed at one time during the bath, but it should be bathed in instalments until it has been covered in full. This method has usually been found to be worth all of two degrees reduction in temperature. Children will submit to this procedure very gracefully, unless the manner of application is forced. The exposure may ofttimes be avoided by a compress on the chest or abdomen, and where the child dislikes wet applications it is found well to have already mentioned in addition to the ice bag and hot-water bag, an ice bag on the chest or abdomen, the abdomen being more satisfactory than the chest, with the hot-water bag to the feet.

A therapeutic method of great importance in pediatric practice is colonic irrigation. Enteroclysis may be accomplished in young children for the reduction of temperature by the use of a returning tube, the temperature of the water and the quantity of the water to be regulated by the severity of the fever. It is always best to start with a fluid a little lower than the temperature of the child. If the child has a temperature of 103° it would be my rule to start with water at the temperature of 95°. This can be continued for ten or fifteen minutes, and you can gradually reduce the temperature of the water from 95° down to 75° or 70°. In this way we not only remove the products of intestinal decomposition, but carry in fluid for the body, and reduce the temperature at the same time. This rectal irrigation may be repeated every three hours, if the indications should warrant it. While some authorities claim that typhoid fever is a contraindication to this method, we never have found any bad results from its use; on the contrary benefits, besides those of reduction of the fever, are plainly noticeable. Among these may be mentioned a diminution of the tympanites which in turn is no doubt the result of the elimination of the toxins and the emptying of the lower bowel, thus reducing to a minimum, if not entirely eradicating, the possibility of fermentative and putrefactive processes taking place. Then, too, the colon, as far as the irrigating fluid reaches, is rendered more or less sterile, and such toxins as may not be eliminated are at any rate neutralized, while the expulsion of the flatus which usually accompanies the introduction of the tube adds still further to the comfort and well-being of the patient. At times the fluid does not return readily and in that case, gentle abdominal massage, reintroduction of the tube after it has been withdrawn, or the addition of more irrigating fluid will usually produce the desired results. The apparatus employed for this purpose consists of a soft rubber rectal tube which is inserted from twelve to fourteen inches, and a two-quart fountain syringe, held about three feet above the bed, with normal salt solution as the irrigating fluid, the little patient lying either on its left side on the bed, or, if very young and weak, lying on its back on the nurse's lap.

Another valuable adjunct in the management of feverish children, and one now being strongly advocated throughout the medical world, is that of permitting the entrance of plenty of fresh air into the sick room, regardless of the temperature of the patient, the only precaution necessary being the avoidance of draughts, which may readily be accomplished by the intelligent use of screens.

Finally, the care of sick children should include treatment in the open air. The rule at the Medico-Chirurgical Hospital for all sick children is to place them out in hammocks in the yard at the rear of the pediatric department several hours every nice day, regardless of the disease from which they may be suffering, or the age or condition of the child. We have found that by having the little sick ones protected by the proper clothing and placed where the sun's rays do not strike them, many beneficial results are obtained from a few hours in the fresh air, not only so far as their disease is concerned, but also in their general health.

One great advantage of the foregoing methods, outside of their effect on the temperature, is the production of many hours of quiet, restful sleep, the sick child in nearly every case going into a good sound sleep after its bath, its irrigation and its stay in the open air. Another important advantage is that the stomach is saved for its natural purpose, nourishment, and we have proved to our satisfaction many times that if the stomach be used for this purpose only, and not upset by the use of drugs, much more nourishment will be taken by the child in twenty-four hours, and just that much stronger will it be at the end of its acute illness, and in proportion just so much quicker will be its convalescence.

Labor is life; from the inmost heart of the Worker rises his god-given Force, the sacred celestial Life-essence breathed into him by Almighty God; from his inmost heart awakens him to all nobleness—to all knowledge, "self-knowledge" and much else, so soon as Work fitly begins. Knowledge? The Knowledge that holds good in working, cleave thou to that; for Nature herself accredits that, says Yea to that.—Thomas Carlyle.

WHOOPING-COUGH.*

By Samuel A. Visanska, Ph. G., M. D.,

Atlanta, Ga.,

Visiting Physician to Home for Incurables and Physician-in-Charge of Children's Dispensary of the Woman's Board of City Missions.

In presenting this subject to you for discussion, let me state at the beginning that I am sure the gravity of pertussis is scarcely appreciated by the general public or by the physician, and there is more criminal neglect in connection with whooping-cough than with any other disease. Therefore, I feel it a duty to present this paper today. No doubt it has been painful to you as it has been to me to witness the intense sufferings of a large number of children during a paroxysm so characteristic of this disease. Yet many grandmothers delight in telling how their children, at the beginning of a paroxysm would run to a chair, place their elbows on it, give a few whoops, turn pale in the face, eyes would bulge, then would follow violent vomiting or perhaps a hemorrhage from the nose and then the little one, soon recovering would run and play until the next time. The public, unfortunately, believes that every child must have whooping-cough, measles and other kindred diseases, and that being the case it is thought the sooner such diseases are contracted the better. I have heard mothers remark in speaking of a family of children, "might as well let them all take it at one time!" Gentlemen, is it right to allow such ignorant ideas to remain without at least trying to inform the public that children are NOT doomed by any laws of Providence or otherwise to either measles, whooping-cough or other kindred, contagious diseases? We must first of all insist that children suffering from infectious diseases shall not be allowed to play with other children or to come in contact with them in any way whatever; these laws must be absolute and every city or town should have a Board of Health to make such laws and see that they are rigorously enforced. Perhaps some of you are not aware that the death rate from whooping-cough stands third on the list, coming as it does next to gastro-intestinal and pulmonary diseases of infants. Yet what progress has been made or what steps have been taken to find a specific cause or a specific cure for this malady? It is because of the gravity of this subject and for these reasons that I invite your attention to this subject and encourage a discussion of it in order that we may be able to glean new ideas and possibly stimulate each other to further activity and wider research as to its treatment and cure in the future.

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*Read before the Medical Association of Georgia, at Macon, April 21, 1909.

While I have stated that little has been done to isolate this special bacillus, yet a number of bacteriologists have already done good work in this line and should be encouraged to yet further efforts. Afanassieff in 1887 isolated a short bacillus which he named the Bacillus Convulsivae Pertussis. The other investigators prominently identified with the influenza-like organism of pertussis are Spengler, Jachman and Krause, abroad; and David J. Davis and Martha Wollstein on this side of the water. They all now agree in finding a minute hemophilus bacillus indistinguishable in morphology and cultural peculiarities from B. influenza of Pfeiffer. Davis has found the influenza-like bacillus in fifty-six out of sixty-one cases of pertussis studied in all stages. Wollstein found it in twenty-nine out of thirty cases examined. Bordet and Gengor found a small bacillus different from the influenza-like bacillus.

Pathology. There is no lesion that can be considered characteristic of whooping-cough; it is only when complications arise that we get a true pathologic condition. In the beginning there is a catarrh of the nasopharynx and this may be the only lesion coincident with the development of the characteristic cough. In advancing cases this naso-pharyngeal catarrh becomes generalized by extension to the lachrymal ducts, the conjunctivae, the eustachian tube and the middle ear; to the glottis, trachea, large and small bronchi and the air vessels. The more decided pulmonary lesions, emphysema, pulmonary collapse, pulmonary congestion and oedema and broncho-pneumonia are advanced pathologic conditions accompanying the later stages or more intense form of the disease.

Etiology. As I have already stated that, while the true bacillus has not been isolated, still we know and I believe all will agree, that the disease is contagious and seems to have a tendency to occur in epidemics every two years. One attack usually protects a child, yet exceptions to this rule have been reported. These epidemics are more frequent in the fall and spring. As to the age of the child the disease is not frequent after ten years, the majority of cases being under 3 years and frequently before the first year, at which period it is very fatal. The true nature of the disease is not yet fully settled; many writers claim it to be a simple bronchitis due to cold associated with certain nervous habits of mimicry. It has also been stated that the disease is a lesion of either the pneumogastric, phrenic, sympathetic or recurrent laryngeal nerves. If this ground is valid it is simply a neurosis. Eustace Smith says it is caused by the pressure of the enlarged tracheal and bronchial glands upon the terminal filaments of the pneumogastric nerve. I believe whooping-cough to be an infectious catarrhal process which affects the mucous membrane controlled by the superior laryngeal nerve and the value in many cases of purely local treatment indicates that the abode of the germ is in this region when the poisonous products of the growth are absorbed.

Symptomatology. As to the symptomatology you are all too familiar with these to make it necessary for me to go into details. It is necessary for us to try to recognize the disease as early as possible so as to place the little patient not only under the best possible hygienic and medical treatment, but also to protect the other children in the house or neighborhood from contact with the disease. This early diagnosis is important, because I believe whooping-cough to be contagious throughout its entire course from the very beginning of the catarrhal stage until the cough with expectoration ceases entirely.

Complications. Hemorrhages from the mouth, nose, conjunctivae, ears and in a few cases intra-cranial are observed in many cases. Broncho-pneumonia, emphysema, gastro-enteritis, marasmus, vomiting, often distressing convulsions, more frequent in infancy, tuberculosis, paralysis, aphasia as well as disturbance of the sight and hearing are some of the other complications arising from an apparently "simple" case of whooping-cough, while hernia, umbilical and inguinal, also eneuresis are not uncommon.

Treatment. It will be difficult in the time allotted to me to cover all the small details of treatment, and, as I have already stated, I trust the day is not far distant when we will know the specific cause and will have found a specific cure for this disease. But until that time arrives much can be done to lower the enormous death rate. In the first place I firmly believe that all cases of whooping-cough should be isolated; this should apply even to suspicious cases especially if there are children near under 3 years of age. Then, we should have hospitals to receive and treat whooping-cough just as is done for scarlet fever and diphtheria. In this connection I will read you what the editor of PEDIATRICS has to say on this subject in the edition for October, 1908: "Whooping-cough hospitals, a need of every large city. Every physician of large experience with babies and young children must have been confronted many times both in hospitals and private practice with cases of Pertussis that needed the constant nursing and medical supervision of a good hospital. In infants Pertussis alone is sufficiently formidable, but when to it is added any one of the complications the case becomes indeed serious. Statistics from New York City for the year 1905 show that the deaths from whooping-cough in children under 5 years old amounted to 397. This is a greater number than died at the same ages during the same year from scarlet fever, diphtheria and malaria combined. Broncho-pneumonia, colitis and cerebral hemorrhage comprised a group of very dangerous maladies to be borne by a baby already depleted by the vomiting, inanition and muscular strain of the primary disease. No hospital in New York City will knowingly receive cases of whooping-cough. This is a crying shame. But New York is not unique among American cities in this respect. So that with all our boasted advance we are far behind France and Germany in this respect."

Hygiene. A rational fresh air treatment should always be carried out, for an appreciable reduction in the number and severity of paroxysms results when the patient is outdoors and the number of these attacks at night will be no greater than during the day if the room be properly ventilated, with a sustained temperature of 60 to 70 degrees F. In very cold and inclement weather and in febrile cases the alternate use of two rooms, with thorough airing of each after use is recommended. The clothing should correspond to the season of the year.

Diet. Attention to diet is very important as vomiting is often a persistent and at times an alarming condition. Nutritious, easily digested food should be given often and in small quantities, the best time to administer it being just following a paroxysm. For the vomiting Dr. W. T. Kilmer of New York has advocated the use of an abdominal belt made of linen with a strip of elastic webbing under each arm and fastened by lacing up the back. Besides the relief of the vomiting he claims that the number of paroxysms are reduced and complication rendered less frequent by wearing this belt. An objection has been raised to the belt on the ground of its causing hernia. It is doubtful, however, if this is true. In connection with this I will state that last year I was called on to treat not less than six cases of umbilical hernia within a week, each case being the result of pertussis. Some cases were already wearing different kinds of apparatus, but I used the Z. O. adhesive strips and all made good recoveries. The thought then occurred to me that this very troublesome complication might be presented by the application of the strips (just as in hernia) during the convulsion stage; my idea being that it were better to wear the strips a few weeks than a few months.

Medical Treatment. As in other diseases where we have no specific remedy, nearly every preparation in the pharmacopæia has been tried and yet only a very few have been used with any success in this disease. We must remember that we are dealing with a self-limited disease such as scarlet fever, typhoid fever, etc., therefore, much can be done to make the little patient comfortable, reduce the number of paroxysms and possibly prevent complications. It is a bad idea to begin medication to any extent until you see the need of it, just as it is a bad idea to stimulate the pulse in pneumonia and kindred diseases before the heart needs assistance.

For the first or catarrhal stage you might treat as for an ordinary bronchial catarrh, but it is for the second or paroxysmal stage that the doctor is usually called to treat the little patient and even then he is seldom summoned until the disease is at its height. Naturally, he is then taxed to the extent of his skill to bring any relief to the small sufferer who is having from twenty to eighty paroxysms in the twenty-four hours, principally at night. It is right here that we all differ in treatment and I might mention fifty preparations that have been used.

Local Treatment. Local treatment will give you good results in many cases, a spray of peroxide of hydrogen, glycerine and water or a few drops internally to infants. Medicated steam often brings relief, especially where the mucus is tight and ropy. A croup kettle can be used to convey the steam or a coffee.pot will suffice. The medication should consist of carbolic acid, oil eucalyptus and turpentine.

Local applications of mustard and camphorated oil seem to make the child more comfortable. To cut down the number of the paroxysms I find the drugs most useful are sodium bromide, belladonna, antipyrine, quinine, bromoform, and recently I have used passiflora incarnata (May-pop). Until I began to use passiflora, my preference was for a combination of antipyrine and sodium bromide, but my results from the use of passiflora have been so satisfactory that I have discarded everything else in its favor. I have used this preparation in thirty-two cases and the results were astonishing; the severe cases being converted into mild ones and all complications were averted. It is non-toxic, does not constipate, is palatable and leaves your little patient with no bad after-effect. Begin with average doses every two hours and increase the dose until the paroxysms are under control. I used passiflora at my free dispensary for children in twenty-three cases and in my private practice for nine cases. I hope and expect later on to make a more extended trial and a fuller detailed report.

* * * * * *

Last April when I read the above paper before the Georgia Medical Association on the subject of Whooping-Cough, I mentioned the use of passiflora, among other drugs to be used as remedial agents in this disease, and I promised to report further as to the results obtained from this remedy. When I made the above report I had used passiflora in about fifty cases and since then I have increased that number by seventy-five and I, now, think the combined number furnish enough cases from which to demonstrate the good or bad effects of the remedy.

At the free dispensary for children under my charge (situated at 74 S. Boulevard Atlanta), I have given this drug a thorough test and have also used it on some twenty-five cases in my private practice. I am indebted to Miss Cason, the nurse at the Dispensary, for a reliable report of the cases treated. I suggested that she select only severe cases on which to report, as the mild ones could usually take care of themselves.

The following are a few from the number watched and from which careful and accurate reports have been received.

1. Baby S., age 8 months. Cough got gradually worse until the child could not rest during the night. The mother reported the case to Miss Cason and the baby was brought to the Dispensary. I found the child much emaciated; temperature 99; a few coarse rales over chest. It had one severe paroxysm at the Dispensary and I requested the nurse to keep a record of the paroxysms for the 24 hours before beginning the treatment. The report showed that the child averaged three paroxysms per hour or seventy-two (72) in the twenty-four hours. I then directed that the passiflora be given every two hours until the paroxysms were reduced in number and severity.

Next day the report came that the child had rested better, the paroxysms being reduced in number from seventy-two to forty-eight in the twenty-four hours. I then ordered the dose increased and the following day a still more decided improvement was shown, there being only thirty-six paroxysms in the twenty-four hours and this number was gradually reduced until there were only eight or ten mild paroxysms in the twenty-four hours.

2. Baby J., aged two years. A rather delicate child, began coughing about two weeks before it was brought to us; mother said cough was increasing in severity, especially at night. When the paroxysms were unusually severe the child vomited several times and could retain very little on its stomach. I requested Miss Cason to keep a record of the paroxysms for the twenty-four hours, as in the former case. This was done and the report was that there were about forty-eight, all unusually severe and accompanied by vomiting. I ordered passiflora given every two hours until the paroxysms were controlled, and I wish to state right here, as was also stated to me by Miss Cason that the result was most gratifying. The severity of the paroxysms were lessened thereby decreasing the tendency to vomit. Each day the child seemed to take a new lease of life and by increasing or decreasing the dose of passiflora as the occasion demanded she made an uneventful and steady recovery.

3. Baby L., age eighteen months—a private case—commenced coughing some days before I was called in. When I saw the little fellow he was still quite plump but his eyes were badly injected with lids much puffed. The mother said he could not sleep at night and that he vomited with nearly every paroxysm. She had used several different preparations recommended for whooping-cough and was then burning a cresoline lamp in the room. I requested that before giving the passiflora she keep a record of the number of paroxysms for the twenty-four hours. I wish to say that this mother was a very intelligent woman and was glad of the opportunity to test the drug. She reported an average of four paroxysms an hour or ninety-six (96) in the twenty-four hours. That may not seem a great many to some of us, but when we con-

sider the amount of energy spent by the patient and the intense suffering entailed it should be a matter of supreme gratification to us all to be in position to relieve so distressing a condition.

In this case I ordered passiflora given every hour, if necessary, and pushed the dose as the little fellow was much exhausted and had slept very little. As in the other cases the mother reported a wonderful improvement, and she called me up over the telephone to tell me the result of the treatment the first night. The paroxysms were reduced in number and severity each day and this very severe case was soon converted into a very mild one.

These are but samples of the number of cases I could report but these are enough to prove conclusively that passiflora is almost a specific during the paroxysmal stage of whooping-cough. Then, too, it is non-toxic, does not constipate and is palatable. There could be added a little syrup of tolu if desired.

Before I began to use passiflora my preference was for a combination of antipyrine and bromide of soda.

I claim that we can do as much for whooping-cough as we can for typhoid fever. While both are self-limited diseases and we cannot cure either one, yet it is of paramount importance to know how to make the patient comfortable, and also to bring him through the disease without dangerous complications. While surgery has advanced wonderfully during the past few years it is a fact that our materia medica and pharmacopœia has been held in the background and has not made progress consistent with the demands upon it. Few of us have attempted to bring out any new treatment, and are really inclined to be contented with old ideas and accepted methods of treatment.

Passiflora is not official, but I trust it will be given a thorough test and that it will find a place in the next pharmacopœia.

318-319-320 Prudential Bldg.

Everything in Nature seems to have this sign on it, "Move On." Nothing stands still. Every atom in the universe is on the move. You must either move on or get run over.

ROSEOLA INFANTILIS.*

By John Zahorsky, M. D.,
St. Louis, Mo.,

*Clinical Professor Diseases of Children Medical Department,
Washington University.*

The name roseola infantilis had an important place in the medical terminology of writers on the skin diseases of infancy more than twenty-five years ago. Willan distinguished several varieties, and subsequent writers followed his classification in the main. The older works on pediatrics had descriptions of the disease, but it is obvious from these descriptions that many different eruptions were confused in this heading as Hardaway (Keating's Cyclopedia of the Diseases of Children, Vol. IV, page 17) pointed out. On the advice of the dermatologists the name was dropped and recent text-books on pediatrics do not mention this affection.

Now, I desire in this article to bring the subject up once more for discussion, for I feel convinced that there is a symptom-complex, a febrile erythema, occurring mostly in infants, which deserves a place outside of the erythema group of skin diseases, and to which the name roseola infantilis was given by the older writers, who however, did not differentiate this disease from rubella and other skin diseases.

For several years I have kept this group of symptoms in mind and every year I see at least five or six such cases. The patient is almost always a child under three years of age who is suddenly taken sick with high fever. The physician is called and on examination of the patient finds nothing abnormal. The fever continues but nothing abnormal can be found on the second, third and even the fourth day, when the fever drops by crisis and the child who has been drowsy or very irritable sits up and commences to play. Coincident with the drop in the temperature a morbilliform rash appears on the face and neck and rapidly spreads over the body. The eruption disappears in 24 to 48 hours. There are no sequelae. No desquamation follows the disappearance of the rash.

These are the striking and characteristic symptoms; a prodromal fever lasting from two to five days, disappearance of the general symptoms with the appearance of the rash, and a morbilliform eruption. Basing my remarks on brief notes of fifteen cases the following is an analysis of the symptoms.

Fever. This is usually high, ranging from 102 to 105 degrees F. The usual temperature at the physician's visit is about 103 degrees. The elevation in temperature is continuous with moderate morning remissions. It is accompanied by extreme restlessness at night and drowsiness during the day. The fever falls by crisis within a few hours of the appearance of the eruption. In one or two cases the fever disappeared a few hours before any eruption was observed. In most cases it persists until the macular rash has covered about one-half of the body.

The Eruption. This is distinctly morbilliform, that is a rose-red macular, or maculo-papular eruption, showing circular or elliptical lesions varying in diameter from one to three millimeters, with a healthy skin intervening. The rash is most marked on the trunk, less so on the face. The back, buttocks, and thighs are generally well covered. The lesions may occasionally be very sparse and limited to the trunk. There is no crescentic arrangement, as in rubeola, and the lesions are generally not raised above the skin; rarely they may be somewhat elevated.

The Respiratory Tract. There are no catarrhal symptoms except congestion of the fauces. Sometimes the disease at the onset may be mistaken for a grippal angina. A macular exanthem was sometimes seen on the palate on the day preceding and coincident with the eruption. Koplik's spots were absent.

The Gastroenteric Tract. Vomiting was noted in a few cases. Diarrhea was present in two cases. Several of the little patients showed some signs of indigestion, but nothing characteristic.

Desquamation. None was observed.

The Lymphatic Nodes. The superficial lymph nodes in the neck were very slightly enlarged in most cases. The axillary and inguinal nodes seemed normal.

Etiology. All of my cases occurred in infants under two and one-half years of age. Sex seems to exert no influence. All the patients were fed on artificial food, or were given supplemental feeding to breast milk.

The disease is not contagious, only in one family did more than one case occur. These were two little boys, aged 2½ and 1½ years, who had the eruption three days apart. Older children who have not had rubella remained with the little patients continually without contracting the disease. The comparative isolation of these young children renders the assumption of a contagion almost impossible.

Most cases occurred in the summer or autumn, yet the disease may occur at any time throughout the year.

Last spring I saw two cases and at that time an epidemic of measles raged in St. Louis. At no other time was any connection between epidemics of the exanthemata and the appearance of this disease observed.

The active cause of the disease is unknown. That it is due to an intestinal intoxication is possible, but there is not much in my series to support this view.

Differential Diagnosis. There is only one exanthem which need be seriously considered in diagnosis and that is German measles (rubella). Measles, scarlet fever, Duke's disease, and erythema infectiosum have distinctive characters not possessed by roseola which are sufficient to separate them positively from the latter disease. So many writers have attempted to separate certain clinical types of rubella from the disease proper that one is almost subject to ridicule to make another attempt. It is probably true that rubella is a name applied to a group of closely related infections but roseola has such distinct features that I must insist that it deserves a separate place in our nosology. A parallelism between the two diseases clearly shows the distinction.

RUBELLA.

Prodromal fever a few hours. Fever rises with the eruption. Occurs at all ages.

Contagious.

Occurs mostly in the spring. Glandular enlargement.

ROSEOLA.

Prodromal fever 3 to 5 days. Fever disappears with the eruption. Occurs mostly in infants.

Not Contagious.

Occurs mostly in the fall. Very little glandular enlargement.

Occasionally rubella is characterized by a prolonged prodromal fever, but other symptoms and its contagiousness separate it from roseola.

I have seen rubella in several epidemics and also in isolated cases and yet the syndrome presented by roseola is different.

Roseola cannot be placed in the category of the exudative erythemata for obvious reasons. It is not a drug rash; it differs from the ordinary erythemata in being preceded for several days by fever.

Older Descriptions. In Meigs and Pepper's text-book (Diseases of Children) the following description is found after describing different forms of the disease, some of which are clearly toxic erythemata: "Again, in a yet more marked form, which frequently but by no means exclusively, occurs in warm weather, when it is styled roseola aestiva and autumnalis, the eruption is symptomatic of a more definite constitutional disturbance. It begins with more or less chilliness, alternating with heat, with loss of strength and spirits, with headache, restlessness, sometimes mild delirium, and even, it is said, though we have never seen them, with slight convulsive phenomena. At the same time there is some slight febrile reaction * * * * * *.

After these symptoms have continued for two, three, four, or even six or seven days, the eruption appears first upon the face and neck, whence it extends in twenty-four or forty-eight hours to the rest of the body. The rash resembles very closely, in some cases exactly, that of measles; but the catarrhal symptoms are absent. * * * * * *. The eruption is sometimes accompanied by itching, and sometimes by stinging pain, and the febrile symptoms generally continue, though moderated in degree after the appearance of the rash; while in other instances the fever disappears entirely from that moment."

I cite this description to show that such cases have been observed although many of them were confused with rubella, dengue and other eruptions.

Dermatologists probably do not see these cases, as the general practitioner treats them through the febrile stage for a variety of conditions and when the eruption appears there is such amelioration of the symptoms that counsel is not sought.

Whatever be the cause of the disease, the clinical features are so definite that the disease deserves a place in our nosology, and I take this occasion to urge its further study.

1460 S. Grand Avenue.

We had a physician in our city whose smile was commonly reckoned as being worth five thousand dollars a year to him, in the days too of moderate incomes. You cannot put on such a smile as that any more than you can get sunshine without sun; there was a tranquil and kindly nature under it that irradiated the pleasant face it made one happier to meet on his daily rounds. But you can cultivate the disposition, and it will work its way through to the surface.—Oliver Wendell Holmes.

A REPORT OF THE HYPODERMATIC ADMINISTRATION OF IRON CITRATE AT BETHESDA FOUNDLINGS HOME, AFTER THE PLAN OF DR. MORSE.*

By T. Wistar White, M. D.,

St. Louis, Mo.

With the permission of Dr. Saunders I wish to report the results of this treatment in the following cases:

The first case on which we used this method was one of Dr. Saunders' in the hospital. Unfortunately no record was kept of the blood examination, but the improvement was so obvious that Dr. Saunders ordered me to carry out the treatment in the Foundlings Home.

The first case selected was that of Hiram, age 2½ years, skin of pale yellow color, mucous membranes and conjunctivae white. Both spleen and liver enlarged. Organic iron had been given by mouth with no apparent benefit.

July 26.	Erythrocytes	3,300,000
	Hemoglobin	below 20
	Poikilocytosis	marked
	Normoblasts	one

Iron citrate gr. ¾ administered every other day.

Aug. 17.	Erythrocytes	5,500,000
	Hemoglobin	50
Sept. 17.	Hemoglobin	70

Liver at lower border of ribs and spleen not palpable. His skin has good color.

Isabelle, 21 months old:—

July 24.	Erythrocytes	3,200,000
	Hemoglobin	30
Aug. 17.	Erythrocytes	4,800,000
	Hemoglobin	65
Sept. 25.	Erythrocytes	5,980,000
	Hemoglobin	80

Jason, 18 months old:—

July 17.	Erythrocytes	5,200,000
	Hemoglobin	40
Aug. 17.	Hemoglobin	70

Myron, age 2 years:—

July 27.	Erythrocytes	5,600,000
	Hemoglobin	40
Oct. 9.	Hemoglobin	85

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*Read before the Bethesda Pediatric Society on Oct. 22nd, 1909, St. Louis.

The other cases treated show similar results. We used the method practiced by Dr. Morse as described in his paper published in J. A. M. A. on July 10th, 1909, injecting iron citrate gr. ¾ beneath the skin of the back every other day.

We noted certain phenomena not mentioned by Dr. Morse in his article, namely the local reaction, vomiting and fever. Usually in less than an hour, frequently in a few minutes after the injection, there is severe vomiting, which soon passes off and does not interfere with the next feeding. Some hours later, rarely not until the next day, there develops at the seat of the injection a local reaction varying from a slight erythema over a small area to a general redness and swelling from the shoulder to the buttocks. The latter condition occurred in only two cases and with the first dose and did not recur in subsequent injections in the same child. In both cases it passed off in 36 hours. In nearly all cases the redness and swelling had disappeared by the next morning and in some it did not occur at all.

Following the emesis there was a slight rise of temperature, usually from 100 to 101 F. In the cases mentioned above as showing a severe reaction, the temperature reached in one 102 and in the other 104 F.

The reactions, vomiting and fever, were always proportionate. In those cases in which there was no vomiting there was rarely any rise of temperature or local redness. A circumscribed collection of fluid followed the injection in two cases but as there was, after two days, no redness and apparently no pain on pressure, they were not incised and were absorbed in about a week. Unless these be considered as such, no abscesses were produced.

That iron citrate administered in this way is both an emetic and an irritant, I have proven to my own discomfort, using a solution stronger and more concentrated than that used on the babies. Apparently there is great variation in the action of this salt, one sample manufactured by Squibb inducing less of these untoward effects than several other lots produced.

3649 Vista Ave., St. Louis.

DISCUSSION.

Dr. Grindon stated that he was not familiar with the clinical picture drawn by the essayist. It is evident, however, that the authors quoted confused various erythemata. He was rather inclined to think that some of the cases referred to were forms of röthen, a disease which assumes wide variations in the clinical appearances. Dermatologists have generally dropped the use of the term roseola, and the name erythema has been given to a number of different eruptions depending on toxic substances. It is possible, however, that the syndrome mentioned may not be familiar to dermatologists as it is unlikely that these cases are referred to the specialist in diseases of the skin.

Dr. Saunders had observed a number of such cases as described, but he generally regarded them as isolated cases of German measles. He reported two cases occurring in one family, both having marked prodromal symptoms and rapid amelioration when the eruption appeared. He had made the diagnosis of rubella in these cases. He doubted that a separate disease existed that had such definite clinical features as described.

Dr. Tuttle stated that the analysis of Dr. Zahorsky's remarks seemed to indicate that the differential points against German measles were, the higher temperature, the longer prodromata and the sudden termination of fever with the appearance of the rash. He asked if it were not possible to account for these symptoms as unusual types of German measles.

In response to Dr. Tuttle, Dr. Zahorsky stated that these were not the only points, he said that the seeming absence of a contagious element should be emphasized also.

Dr. Zahorsky, in closing, declared that whatever be the cause of these cases, he could not regard them as rubella. While occasionally during an epidemic of rubella cases are seen which show a prodromal stage of several days, still these are exceptional, and there is no such rapid defervescence of the temperature on the appearance of the rash. These infants were all practically isolated from possible contagion. No cases of rubella to his knowledge were in the city at the time. The uniform clinical features had convinced him that roseola infantilis deserves clinical recognition.

SOCIETY TRANSACTIONS.

A Conference on Prevention of Infant Mortality.

Third Mid-Year Meeting of the American Academy of Medicine, Lampson Hall, Yale University, November 11 and 12, 1909.

The conference was opened by a brief address of greeting by President Hadley of Yale University. The response was made by Dr. W. Blair Stewart of Atlantic City, a vice-president of the Academy. There were four sessions, the first, devoted to the medical prevention of infant mortality was presided over by Dr. J. H. Mason Knox, Jr., associate in pediatrics at the Johns Hopkins Medical School.

The importance of a baby as a potential citizen and the responsibility of the community to the baby as the citizen of the future, were strikingly brought out in the address of Dr. J. H. Mason Knox, Jr., associate in pediatrics at the Johns Hopkins Medical School, Baltimore, and chairman of the session on Medical Prevention. The program for that session included a series of papers, each of which considered a specific phase of the problem. The relation of alcoholism to infant mortality was discussed by the chairman; the relation of syphilis to infant mortality by the secretary of the section, Dr. R. A. Urquhart, of the Johns Hopkins Medical School; of tuberculosis to infant mortality by Dr. Clemens von Pirquet, formerly of Vienna, now of the Johns Hopkins Medical School; of mothers' occupations to infant mortality by Dr. Caroline Hedger, of the Chicago United Charities, and of diet to infant mortality by Dr. J. P. Crozer Griffith, of the University of Pennsylvania. Touching upon the problem as a whole, Dr. Knox said it is now generally recognized that united effort will be necessary to curtail the long-prevailing infant mortality. This of itself means a step forward. Physicians should be in the van of the movement, he declared, because, as a class, they are in a position to understand more thoroughly than the layman can the factors which bring about this large death rate among infants, and they know how it can be much diminished.

"Public sentiment must be aroused," he said, "to insist upon suitable hygienic surroundings, adequate care and proper diet for every new-born babe. The minimum of these requirements must be pointed out by the physician. No field in medicine is more enticing.

"The potential energy of an infant saved from death by proper medical care and nursing supervision cannot possibly be reckoned. The future of these little lives cannot be foretold as can the lives of adults saved from disease. It behooves us, then, as physicians to investigate thoroughly every source of this appalling death rate, and to make them known to the public, at the same time suggesting remedies.

"Among the factors directly and indirectly destructive to the life of infants in this country, and in most civilized countries, is acute and chronic alcoholism of the parents. The lowered vitality of the parents consequent upon the habitual use of alcohol has a direct effect on the vitality of the child. If alcohol is indulged in in large quantities by the expectant mother, it will be apparent in a lowered vitality of the child. The indirect effect of chronic alcoholism in the home on the life of the young child is to weaken its powers of resistance to disease, and to deprive it of the right which every child should have for a normal healthy existence."

Dr. Clemens von Pirquet, professor of pediatrics in the Johns Hopkins Medical School, presented a paper on the relation of tuberculosis to infant mortality, which was an important feature of the opening session. Before coming to America Dr. von Pirquet was associated with the Escherich Clinic for the Diseases of Children in the University of Vienna, and in connection with his work in Austria he made a special study of tuberculosis in children. He was one of the first investigators to test for the presence of the disease in children by the use of tuberculin, applied cutaneously. The great frequency of tuberculosis is indicated, he said, by the figures embodying the results of postmortem examinations, carried on in Berlin, Vienna and New York. Children infected within the first year of life nearly always die from tuberculosis. If the infection occurs in older children the disease is often localized, and the result is not necessarily fatal. The best prophylaxis, the speaker declared, would be the entire separation of infants from adults who are tuberculous, even from their parents, if the latter are suffering from the disease. Since such a separation is not always practicable, he advised against the kissing and fondling of children by people who are tuberculous. He warned also against coughing in the presence of a child.

Dr. Thomas Morgan Rotch, Boston, expressed the opinion that in the antituberculosis work care must be taken not to exclude tubercular patients from institutions in which they would be benefited and in which they do no harm. He instanced a hospital in New England which was eminently fitted to receive tubercular babies and young children, but from which all were excluded. Finally acting upon his advice, non-infectious cases were admitted. As a result complete cures were effected within three or four months. The medical profession was indebted, he said to Dr. von Pirquet for his development of the subcutaneous test for tuberculosis, as it has proved to be a means of detecting the disease in an earlier stage than is possible through any other means. Dr. von Pirquet's work with tuberculin would make his name go down to posterity as one of the great reformers in tuberculin investigations, and as one who has done an immense amount of good to humanity.

Dr. Ward Crampton, New York, asked Dr. von Pirquet if he would advise the segregation of school children who have reacted positively to the subcutaneous test. One society in New York discovered that 23 per cent. of the children examined responded positively. If an examination of the public school children would reveal the presence of tuberculosis among an equally large percentage of the children, the problem of separation and segregation would assume very serious proportions.

Replying to the discussion:

Dr. von Pirquet said in response to Dr. Putnam's question that a good cleaning of the whole house, with painting of the walls and fumigation of the rooms would be required to render the building free from infection.

Referring to Dr. Rotch's remarks in regard to the institution which had excluded children suffering from tuberculosis, Dr. von Pirquet said it had not yet been proved to what extent these children are sources of infection; that he did not consider it necessary to separate the children in a hospital except in the case of those suffering from open lung tuberculosis. He advised the separation of the tuberculous children from the well children when the test reveals the presence of the disease in an institution like an orphan asylum, but did not urge the segregation of school children. Dr. Rotch disagreed on the latter point, expressing the opinion that the child who reacts positively should be taken out of school for his own sake, so that he may have outdoor treatment, and not because there is danger of his being a source of infection to others, especially as he did not consider that the danger always existed.

Dr. Guy Kiefer, Detroit, asked Dr. Rotch whether it would be necessary to distinguish between open and closed cases among school children who reacted positively to the test and who had on that account been segregated from the rest.

Dr. Rotch replied that his previous remarks had applied only to non-infectious cases; that the infectious cases should be isolated just as measles and small-pox are.

In discussing the relation of syphilis to infant mortality, Dr. Richard A. Urquhart, instructor in pediatrics at the Johns Hopkins Medical School, Baltimore, said: "Of all the grave consequences following upon this one of the modern plague none are so serious as those of heredity. The high rate of infant mortality among the children of such parents is its greatest social danger. Many others, fortunate or unfortunate enough to survive its first effects, grow into a weakling childhood and manhood, a misery to themselves and a public charge. Few greater problems offer themselves to the philanthropist, to the social worker, the teacher and the state. The false position assumed toward social diseases by the authorities and the consequent ignorance of the far-reaching effect of such diseases is an everlasting disgrace to our modern civilization. It is high time that physicians, knowing its perils, force upon the powers that be the right of the public to protection, as in the case of any other contagious disease. The details of the required laws and methods of making them efficient will work themselves out. After all, however, the most potent influence will be in giving the public, and particularly young men, some knowledge of the serious and far-reaching effects of such diseases. It is not merely prohibiting a fool from his folly. Too frequently the innocent suffer; the state is called on to support weaklings, and racial degeneracy results.

DISCUSSION.

Dr. Helen C. Putnam, Providence, advocated placing syphilis among the reportable diseases.

Dr. Urquhart in reply said that in view of the dread of publicity felt by persons suffering from syphilis, there was danger that they would not seek medical aid, and the result would be worse than if there were no report.

Dr. J. Morton Howell, Dayton, suggested that one solution of the problem would be the introduction of courses of lectures by the medical inspectors of the schools, into the curricula of the boys' high schools.

Paper by Dr. Alice Hamilton, Chicago, on excessive childbearing as a factor in infant mortality. This paper embodied the results of a statistical study of 160 families with regard to the number of children born and the number who died in birth, in infancy or early childhood. The families selected were almost all from the poorer, wage-earning class, the parents being foreign born in all but three per cent. Families with six children were placed in one group; those with four were considered in another group, and less than four in another group. The percentage of child mortality in the first group was over two and a half times that in the second group. As the nationality, economic standing, mode of life and knowledge of infant hygiene was the same for the two groups, the explanation of this great mortality in the larger families was probably to be found, Dr. Hamilton said, in the insufficient care given to the over-numerous children, and in the exhaustion of the mothers through excessive child-bearing. Grouped according to nationalities, the lowest child death rate was shown in the Jewish families, with the American-born next. The highest death rate was found in the children of Italian parentage, with the Germans, Irish and Slavs ranging in between, in the order named.

DISCUSSION.

Dr. Theodate Smith, Clark University, Worcester, Mass., said that she had made a study of the mortality among the wives of Yale and Harvard graduates, going back two hundred years, and found that thirty-three per cent died before they were thirty-five years old. She had discovered also, in tracing out the records of one of the old New England families for a number of generations that the large families seemed to tend to be extinguished by the fourth or fifth generation. As an instance, she mentioned a family in which there were twenty children; eight by the first wife and twelve by the second, but in which there are now no living descendants, except through one son. She instanced a second family of ten children, the mother of whom died at the age of forty. Of the ten children, the three youngest were invalids; two lived to the age of thirty-eight married. Of these marriages there are only three descendants surviving.

."The Educational Responsibilities of A Milk Depot" was the subject of an interesting paper presented by Dr. Ira S. Wile, of New York. Dr. Wile has for some time been in charge of the consultation at one of the Infants' Milk Depots of the New York Milk Committee, where he has been remarkably successful in holding the interest of the women who attend, and in securing visible results of his efforts to teach them. He is also secretary of one of the district committees of the New York Charity Organization Society and clinical pathologist of the Children's Department of Vanderbilt Clinic. "The educational possibilities of a milk depot," he said, "are the only limits to its educational responsibility. The ultimate aim is to make the milk depots unnecessary institutions by teaching the mothers to nurse the children. The function of such a depot should be not merely to supply a milk for infant feeding, but to teach the mothers why it is supplied. Its responsibility is three-fold—to the infant, to the family, to the community.

"So far as the child is concerned, the responsibility lies in attempting to supply a proper milk; that is, its own mother's milk. An index of the value of a milk depot lies in the number of nursing mothers visiting it—not in the amount of modified milk sold. At each depot there should be a museum to exhibit all that relates to child hygiene from the pre-natal period to the school period.

"To the family the depot is responsible for teaching the whole household how to keep the children well; not merely how to avoid letting them die. There should be classes for little mothers and expectant mothers, as well as for mothers with children.

"Toward the community the depot has the responsibility of developing mothers capable of bringing up their children to maturity, and of destroying the possible element of truth in the statement that children grow up in spite of their parents, not by means of them."

Dr. Thomas Darlington, Commissioner of Health of New York City, outlined the work of the Division of Child Hygiene of New York City Department of Health, and in connection dwelt upon the possibility of reducing infant mortality by the establishment of closer relations between the local boards of health and the homes of the people. In discussing the importance of preventive measures in the hygiene of infancy and childhood, he said that efforts for the reduction of infant mortality should go hand in hand with measures tending toward the preservation of the health of the child. The Division of Child Hygiene, he said, represented the correlation of all activities relating to child health in New York City, including the supervision of midwives, control of the boarding out of foundlings, inspection of day nurseries and institutions harboring children, instruction of mothers in the care of the babies, medical inspection and examination of school children, and issuance of employment certificates to children. Dr. Darlington attributed the marked decrease in the death rate from diarrhoeal diseases among children in New York City during the past summer to the work of the bureau. He spoke of the importance of educational measures in public health work, and expressed the opinion that the most essential feature is personal instruction in the home.

In the discussion Dr. J. S. Neff, Philadelphia, said that New York sets the rest of the country an example in the control of the subject by the municipality. The key to the solution of the whole problem lay in the home, he said, and in the application of methods similar to those described by Dr. Darlington. The mortality in Philadelphia of children under five years is 30 per cent of the total mortality, and if congenital malformation and accidents of birth are eliminated, and deaths from disease, only, are considered, it is found that 83 per cent of these deaths or 64 per cent of the total death rate, come from preventable causes.

The campaign of prevention and education should be conducted, he believed, through the board of health, as in New York. No appropriation being available for such an undertaking in Philadelphia, he said that a movement termed the babies alliance was organized two years ago, under the control of the Department of Health, the Board of Public Education, the Congress of Mothers, the Home and School League and kindred societies. Under the direction of the alliance, general and subcommittees have been formed. The city is districted and the entire city is under the supervision of the committee. The names of mothers are given to the committee immediately on the birth of a child; and visits of instruction are paid. Two years' work has resulted in a decrease of 7 per cent in the mortality rate among infants. The examination of, and instruction of midwives by the board of health is included in a plan lately inaugurated in Philadelphia.

Dr. John M. Connolly, Boston, said that emphasis is laid on breast feeding in the work of the Boston milk committee. He favored granting a pension temporarily to a wage earning mother to enable her to stay at home and nurse her baby. Classes for the instruction of the fathers as well as of the mothers were found to be productive of good results.

Prof. Irving Fisher, New Haven, Conn., spoke from the standpoint of the statistician. "Infant mortality is a problem today," he said, "largely because of the decline of the birth rate, and the real problem of infant mortality is connected with the birth rate quite as much as with the death rate. The parent is the strategic point today especially because the parent is exercising volition which was formerly not exercised in regulating the birth rate, and this volition must be matched by a corresponding change in the death rate.

A very interesting report of the Royal Commission in New South Wales was published I think about a year ago, on the decline of the birth rate in New South Wales, and the problem of infant mortality, in their relation the one to the other. It was found that the birth rate in New South Wales had declined something like 25 per cent, and that a corresponding decline, though to a lesser degree, has been going on in other parts of Australia, and in fact throughout the civilized world.

"There are two problems that come out of this, of world wide importance. While we are fixing our attention on preventing infant mortality from the standard of the individual, we will forget that the important point is from the standard of the race, and the two problems which confront races are depopulation and degeneration. It would not be at all impossible that a country, and large classes of a country, should gradually decline in numbers. In fact, college graduates have shown this tendency already so that the birth rate among college graduates so far as statistics of the size of families enable us to judge, shows that graduates of Yale, of Wellesley, both male and female colleges, so far as there have been any records throughout the country, are declining. They are not keeping up their end in the population. And if that should extend to the whole population there will be either depopulation or the necessity of improving the death rate, to keep the equilibrium. If it should ever happen that the better class, by which I mean the vitally better class, should refuse to keep up their end in the population, then the worse classes, the criminal and defective classes, should multiply, in the haphazard way in which animals and hitherto men have multiplied, there will be inevitable degeneration. These seem to me to be the great problems that come out of the birth rate, and the problem of infant mortality is one of them. If we are to keep our population going and keep it from degenerating, we must prevent this needless waste of human life. There are so many factors that enter into the case it is impossible to say today whether there is a decrease going on. The statistical record in Great Britain was inconclusive and there is no corresponding record in this country, and we do not know whether we are decreasing in numbers except for the immigration, as that covers it up, or whether we are degenerating in quality.

"In this connection I would like to emphasize a point that is very close to my heart, not the problem of infant mortality but of health in general, and the problem of eugenics which is largely dependent on information to be obtained through the improvement of the federal organization of health at Washington. A great deal has been said this afternoon in regard to the local work and in regard to the private institution. But those agencies are relatively small as compared with the power of the Federal government. Moreover, they are incomplete, because we never can get a broad view of the population, and the relation of birth rate to death rate in the population, until we get a large area. If we could have a Federal organization of health at Washington to co-operate with the magnificent work that is being done in New York and Philadelphia and other cities and the private work such as has been illustrated in Cleveland, we might hope for the information on which any rational solution of the questions of population, depopulation and degeneration could be solved. It seems to me we need at Washington a bureau of child hygiene, a bureau of health to work in cooperation with the other agencies which have been spoken of this afternoon.

Dr. H. I. Bowditch, Boston, said that the first essential toward a solution of the problem of the prevention of infant mortality was the enactment and enforcement of legislation requiring the accurate registration of births. And registration should be followed up by boards of health as suggested by Mr. Gunn.

Mrs. W. L. Putnam, Boston, described the methods by which the infant social service department of the Woman's Municipal League, of Boston, cares for dependent mothers and children; giving especial attention to the instruction of the mothers in the care of the children.

Dr. W. A. Evans, Chicago. The problem is a large one and its full solution will require the solution of great questions of political economy. Until some health officer tackles the underlying questions of political economy, no satisfactory solution of the problem will be reached. What is needed now is co-operation between the boards of health and the people themselves, the mothers especially. How to get at the mother and through her to get at the child is the great problem. The success in New York has been largely due, he said, to the fact that the board of health had rid itself of the idea that the baby to be sought after was of necessity a sick baby; and realized that it is the baby who has just been born who needs attention, concentrating for the time being on that baby in which there is the greatest coefficient of sickness. The philosophy of the situation would mean, he continued, that before the problem is settled we must come back to the people before the babies are born; and to the circumstances of society that are responsible for the conditions into which the baby is born.

Dr. I. S. Wile, New York, said that a better foundation could not be laid for the hygienic education necessary for the prevention of infant mortality than by utilizing our educational institutions, by beginning with the rational series of well devised courses in hygiene in our public schools.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE.

UNDER THE EDITORSHIP OF KARL H. GOLDSTONE, M. D.,

Physician to the Children's Clinic, Mt. Sinai Hospital, New York.

"The Milk Question from the Standpoint of the Pediatrician." As McKee of Philadelphia in the *Monthly Cyclopedia and Med. Bulletin*, Sept., 1909, succinctly puts it, "the truth is that the milk of every species is the proper food for the young of that species." Aside from the congenitally deformed or diseased, very few breast fed infants die. On the other hand the death rate among the artificially fed is enormous, gastro-enteric diseases looming above all others as causes. A truly good mother should possess the ability to nurse her baby. The two essentials in artificial feeding should be: I, cleanliness; II, proper modification. Nature indicates that the food of the young animal be free from bacteria. Pasteurization though sometimes necessary should be regarded as a temporary expedient, and the home Pasteurization with Freeman's apparatus is best, but commercial pasteurizaion is a delusion. As far as modification is concerned the writer puts his faith in the method of Meigs and Rotch, that is the percentage method. And the baby is the best laboratory for the individual milk or milk mixture. Percentage feeding should be individualistic. Calorimetric methods are good, but only as a check upon the percentage method, rather than as a guide. The percentage method may be expressed in rules. Rule (a) Knowing the ratio of the desired fat percentage to the desired proteids percentage, invert the ratio and make a fraction of it. That fraction represents the level of the quart bottle from which the top milk is withdrawn.

Rule (b) Make the desired amount of proteid, expressed in a percentage, the numerator of a fraction, and make the percentage of proteid represent the denominator. Multiply the total amount of food to be given in the 24 hours by this fraction and the result equals the amount of top milk to be used in the mixture. The remainder is the diluent. The writer believes the casein of cow's milk the chief disturbing element. As for fat, buttermilk answers the requirements perfectly, this article being low in fat and the proteids in it high but readily digestible and assimilable. As for diluents, carbohydrates are best. In weak babies, peptonization is valuable. Milk has no place in the summer diarrheas of infants, as it furnishes a splendid culture medium for the bacteria. The writer concludes by stating that "we are still in unknown country."

"Buttermilk in Infant Feeding." H. Koeppe (*Deutsche Medizinische Wochenshrift*, June, 1909), makes a claim for the superiority of buttermilk in ions which fact adapts it better for infant feeding than cow's milk. Human milk contains little albumin, little ash and large proportions of ions. Cow's milk contains much albumin, much ash, few ions, while "buttermilk gruel" contains much albumin, much ash and quantities of ions. Cow's milk casein is a salt, buttermilk casein an acid, which explains its digestibility. The writer advises "buttermilk gruel" which is made of sour cream, one litre, cane sugar 60 gm., wheat flour 15 gm., boiled up 3 times and then distributed in one meal bottles.

"Reflex Studies in Children." Bychowski (*Deutsch. Ztscrift für Nervenheilk*, 1908), made examinations of the reflexes in children less than one year of age and he found the patellar reflex constant, but not as lively as in adults. The Achilles tendon reflex, on the other hand, was found to be practically absent during the first half of life, becoming more frequent in the second half, until it is fairly constant about the beginning of the second year. The abdomino-parietal reflex likewise is not congenital, appearing gradually in the course of the first year of life. The cremaster reflex is often absent up to the fourth or fifth month, after which time it is lively and constant. Babinski's reflex preserves the spinal type during the first periods of life (first to second year) and remains positive, about the beginning of the second year it undergoes a transformation from the spinal to the cerebral type and disappears. (From *Med. Rev. of Rev's*, Aug., 1905).

"Congenital Pyloric Stenosis Cured Without Operation." E. M. Pearse England, in the *British Med. Jour.*, Oct. 30, 1909, describes such a case, which has been under his observation from birth, and he was then able to watch the development of the symptoms, the attempts at treatment and the cure. The author details the life history of a case of pyloric stenosis which he says must conform to the classical signs and symptoms of Hutchinson, (1) vomiting of a projectile nature coming on immediately a feed was taken down, without signs of gastric disturbance; (2) loss of weight; (3) constipation; (4) visible peristaltic movements in the epigastrium, culminating in a vomit; (5) relief of sypmtoms for a day or so by changing the food. The effect of washing out the stomach combined with small feeds was marvelous and was carried out daily. The child, weighing 7 lbs. at birth, at four and a half months weighed only 6½ lbs., and at thirteen months 20 lbs., the effect of the treatment manifesting itself only after the sixth month.

"The Treatment of Anemia in Infancy with Citrate of Iron Administered Subcutaneously." John L. Morse of Boston in a paper read at the Section Dis. of Children, American Med. Assn., June 1909, relates his experience with this method, and states that infants have a relative haemoglobin deficiency (55-70%) due to the fact that the infant normally receives an insufficient supply of iron in the food, and that the reserve of iron in the liver is not enough to keep the percentage to the standard. All anemias of infants are of the chlorotic type, yet true chlorosis never appears at that age. Iron is indicated therefore, but given by the mouth disturbs the digestion. The best way is an aqueous solution of the citrate given subcutaneously. The injection is never followed by induration. The needle must be of platinum as steel corrodes. The average dose is ¾ gr. every other day. The author states that the improvement with this treatment is rapid, causing a steady rise in the haemoglobin content.

Reduction of Infant Mortality. While deaths of infants due to improper feeding occur at all seasons, digestive disturbances, including epidemic diarrhea are especially prevalent during the summer months. To diminish infant mortality, the milk supply of the people must be protected from the time it is drawn from a healthy cow until it is consumed. Education of mothers then must proceed. Giving of starchy food and all other foods to children is harmful. Education in infant feeding is best given at what is know as "infant consultations" or "milk dispensaries." The baby must be seen each week, weighed, and advice given the mother, encouraging natural feeding. The M. D. is assisted by one or more trained nurses who visit the homes, and give further advice in household management, etc. Other considerations in infant mortality are poverty, which must be tempered by proper charity, and prenatal causes are responsible for the health of babies, as intemperate parents, or underfed or unwisely fed parents. Working too strenuously during the latter days of pregnancy imperils the babies, as does also too frequent childbearing. (*N. Y. State Dept. of Health Bulletin*, Oct., 1909).

"Appendicitis in Children." Bogart in the *L. I. Medical Journal* for November, emphasizes the seriousness of appendical affections in young life, placing the mortality from the disease as 17⅓%, as compared to 2% in adults. That the Murphy-Fowler treatment will give the best results, is shown by the author's death rate—only 10%. In all of the author's fatal cases, death was due to general peritonitis, with or without intestinal paresis, or in other words, from the complications. What is needed is urgent immediate treatment. The diagnosis of appendicitis in children is comparatively easy, though in nervous children there may be some difficulty in deciding. Such cases should be watched carefully as positive signs will appear within 24 hours. The diagnosis narrows itself down to but few diseases, and these are acute indigestion, typhoid fever, ileus, pneumonia, pleurisy, intussusception, tubercular peritonitis, hip disease, hernia and ovarian disease. The most common mistake is made in connection with right sided pneumonia and pleurisy, and a diagnosis between these conditions and appendicitis may be impossible. Bogart looks with suspicion upon any case presenting abdominal pain with nausea, vomiting and elevation of temperature in children. Most of these cases will be found to be due to acute indigestion. If, however, there develops spasm of the abdominal muscles on the right side, with pain and tenderness persisting after a free evacuation of the bowels, appendicitis should be suspected. It is well to remember in children that the point of maximum tenderness may not be located at McBurney's point. There are cases where the appendix is retrocaecal and high up, and the point of tenderness may be posteriorly, or in the middle line. The leucocyte count in the appendicitis of children is of little value. The polynuclear count is of more importance. In operating on children, adhesions are less common, but very friable when present. The author has been dispensing lately with protecting sponges, as they may inflict too much traumatism. The McBurney incision is best. Drainage had to be resorted to very frequently, but was better left out if possible. It is a mistake to waste valuable time in trying to bury the stump. In those cases with intestinal paresis the adoption of the Murphy-Fowler treatment is advised. The author concludes by stating: "I would emphasize the fact that the removal of the appendix in a child is comparatively without danger, and would recommend that it be done in every case as soon as a diagnosis has been made."

Le Grand Kerr lays out the following rules in the treatment of acute anterior poliomyelitis: (a) when seen early, the child is placed in a hot blanket pack, the water being at a temperature of 160° F. This is kept up until free perspiration is induced. This procedure is not to be repeated; (b) Copious drinking of hot water. This was continued at frequent intervals for 12 hours. (c) A hot enema of magnesia sulphate and 2 ozs. of glycerine to the quart of water. (d) Following the enema, a single large dose of castor oil. (e) Cold application to the spine, particularly in the lumbar region. (f) Abstinence from food for first 12 hours. Later the diet was restricted to fluids. (g) During this stage belladonna and ergot were administered, given in large doses. (*Long Island Medical Jour.*, Nov., 1909).

"Toxic Arthritis of the Hip." In the August number of the *Amer. Jour. of Orthopedic Surgery*, Hoke calls attention to a new variety of arthritis of the hip, called "toxic arthritis," which very closely resembles tubercular disease of the joint. The cases occur in children and begin in a manner typical of tuberculosis of the hip, with pain, spasm, limp, deformity and fever. Clinically the affection could not be told from the early stages of tubercular arthritis. In most of the cases, however, there was a history of improper dieting or indigestion, with excessive amounts of indican in the urine, also phenol, suggesting intestinal putrefaction. Elimination treatment with rest in bed cleared the condition in a few days, and proper dieting produced a permanent cure. In the chronic cases, there was softening of the head of the bone, and bone atrophy. In these cases the diagnosis was extremely difficult. A characteristic of the disease is that there was no suppuration of the joint, the fluid being sterile and straw colored. Tuberculin tests proved negative. This disease though less serious than tubercular arthritis, may lead to severe deformities.

"Genetous Types of Imbecility with Ptosis." Barrett of Dublin discusses this type of idiocy in children. A form of degeneration, distinctive because of the absence of such characteristics, such as cretinism, mongolism, etc. The names given for this group may be "genetous," "unclassifiable" and cases of "simple primary dementia." Within this group may be found cases ranging from idiocy to mere backwardness, from children who can neither walk nor talk to those who may possibly be able to earn a livelihood. One of the principal signs in this group of cases is double congenital ptosis. This is due to deficiency of the third nerve or nucleus, other signs of third nerve paralysis, strange to say, are wanting as diplopia and strabismus. The author quotes Dr. W. A. Potts in referring to the etiology of this group of cases, who states that alcoholism in an early generation is responsible, not so much "drink" in the parents. The author then goes on to describe a case with single ptosis and reviews the signs of degeneration. (*Brit. Jour. of Children's Dis.*, Oct., 1909).

"Essential Incontinence of Urine in Children." In *La Clin. Enfant*, Feb., 1909, Mr. Perin discusses different types of this affection, and states that it occurs only at night. The cause is too heavy sleep, which prevents the desire to micturate waking the child. This is confirmed by two facts: I, nocturnal enuresis is almost exclusively observed in infants who are the subjects of respiratory obstruction, and who sleep too soundly, due to carbonic acid intoxication; II, the complaint is cured only when the primary cause disappears. The author believes this night bed wetting to be due to the fact that deep sleep of a child puts its brain completely out of action, and therefore as the centre in the medulla acts alone, the bladder is compelled to act alone, being without this center and the impulse is sent to the depressor. When awake, the sensation of a "full bladder" passes from the bladder to the medulla, then to the cerebral center of perception via the spinal cord. Then the impression is sent to the center of interpretation and this transmits it to the motor center, which acts accordingly.

"Gastric Ulcer in Children." (*Thèses de Paris*, 1908-09). A. Lansier has collected 18 cases, one of which is original, of gastric ulcer in children whose ages ranged from 2 months to 14 years. Ten occurred in girls, 8 in boys. Four cases were associated with infantilism. Two reasons are given for the rarity of gastric ulcer in children: (1) Hydrochloric acid is secreted in much smaller quantities in children, especially during the first years of life. (2) The food passes much more rapidly from the stomach into the duodenum in children. Most cases are latent, but in some there is an early history of indigestion; in others repeated haematemesis or sudden perforation following a violent effort or emotion. Diagnosis is rarely made during life; the usual solution being peritonitis. Pain was present in half the cases, but was never acute except in perforation or stenosis. Haematemesis was absent in two-thirds of the cases. Perforation took place in more than one-third of the cases. Half the cases ended fatally. Treatment should consist of complete rest of the stomach. (From the *British Jour. of Child. Dis.*, Oct., 1909).

"Myotonia Congenita of Oppenheim." W. B. Laffer of Cleveland, Ohio, enters into a detailed consideration of this disease, which was first described by Oppenheim in 1900, and he calls attention to the fact that it must not be confounded with Thompson's disease. The disease is extremely rare, but 25 cases being on record. The trouble is a congenital one, but may not be noticed till the end of the first year. The muscles are soft and flaccid, with great hypotonicity, leading to pseudo-paralysis, mostly in the legs. There is no atrophy. The face is not affected. The deep reflexes are absent. The onset is slow, and not preceded by signs of illness. Heredity plays no factor. Histories of reported cases fail to show evidences of lues or rickets. The muscular distribution is always symmetrical, the legs being most often involved first. The arms come next and the trunk, neck and face less involved in the order named. The distribution of the affection is variable and never the same in two cases. According to Collier and Wilson, the bodily distribution was as follows:

	Involved.	*Normal.*	*Not Noted.*
Face	3	20	2
Trunk	22	3	..
Upper extremities ...	20	5	..
Lower extremities ...	25	..	..

If the face is involved, there results an inability to close the eyes completely, epiphora and a blank expression. The muscles of mastication, sucking, swallowing and respiration are not affected. The muscular weakness varies, but is usually great, making walking or even sitting impossible. There is no local muscular atrophy, as is seen in the myopathies. Fibrillation is not seen and mechanical stimulation is not conspicuous. The affected muscles are toneless, and a condition of pseudo-paralysis exists. There is flail-like condition of the joints, and hyperextension and overextension. Contractures have been present in eight of the cases. Fat deposits at unusual places are seen. The electrical irritability is but slightly changed. The intelligence is normal and the organs of special sense rarely affected. The sensory and vaso-motor functions are normal. The knee jerks are usually absent. The general health and growth of the patient is good. The course of the disease is towards recovery. The author then goes on to differentiate this from other diseases, principally Little's disease, polyneuritis, the muscular atrophies of the familiar type, poliomyelitis, rickets. The treatment consists in looking after the nutrition, protection from infections, the use of electricity, massage, strychnia and surgical measures for the contractures. (*Ohio State Medical Journal*, Nov. 15, 1909).

"Colon Bacillus Pyelitis in Children." Under the heading of medical progress, the *Yale Medical Journal* for Nov., 1909, reviews in detail the history of this condition of childhood. Pyelitis may be secondary to various conditions as renal calculi, tumors, hydronephroses, extension of inflammation from neighboring structures, and congenital anomalies of kidney, ureters and bladder. It may complicate typhoid, the exanthemata, diphtheria, malaria, and pyemia. Various germs may be responsible, among them the b. lactic aeogenes, typhoid bacillus, b. proteus vulgaris, b. diphtheria, b. tuberculosis, streptococcus, staphylococcus, gonococcus, but as Escherich has pointed out the b. coli communis is the most common cause. This form only will be considered here. Heubner states that the avenues of access are three; I, By extension of infection from the urethra, bladder and ureter. II, By extension of infection downward from a hematogenous focus in kidney. III, By the invasion of the bladder by bacilli coming through the structures between it and the rectum.

The first is the commonest portal by far. The symptoms are misleading. Anorexia and vomiting are common. The bowels are disturbed. Painful urination is rare. Loss of weight is marked and rapid. Anemia quickly develops. The cardinal symptoms are the fever, and urinary findings. The fever is not characteristic. Afebrile cases occur. The attack may start with a chill, anorexia, vomiting and prostration. The temperature ranges from 100° F. to 106° F. A physical examination is often negative and the case perplexing. Leucocytosis is the rule. Urinary symptoms are wanting. But urinary examination tells the story. There is marked acidity, and the urine is turbid, but it may be clear. B. coli communis does not decompose urea, and is one of the few germs that can grow in an acid urine. The latter may be found in pure culture. The pus content may reach 50%, microscopical examination shows epithelial cells from various parts of the urinary tract, and the bacteria are easily made out. The prognosis as to recovery is good. Exacerbations are common. Recovery is slow, and may take a year. The treatment advanced by Göppert, consists of the giving of much water by mouth or rectum, alkaline waters. Heubner states that there may be six or eight relapses in a year. Urinary antiseptics are valuable, and the vaccine or serum of b. coli communis may be employed. Citrate of potash is a favorite agent. For urinary antiseptics salol and urotropin are advised. The serum treatment has been found wanting. Wright's technique has proven more valuable.

GONORRHOEA OF LITTLE GIRLS IN VENICE.

By Dr. Minassian (*Revista veneta di Sienze mediche*, 1909).

The author tells of a little boy of four years old being infected by a little girl of eight, in an attempt at intercourse. The little girl was suffering from gonorrhoea; father, mother and sisters were also suffering from gonococcic infection, which would explain the infection in the child. At Venice the author has observed, during five years there, 200 little girls with gonorrhoea, one of whom was only six months old. The vulva vaginitic gonococcus is common in this city, and we should remember that Venice is also one of the cities in Italy and even Europe, where syphilis is most common. As observed, these children frequently suffer from bartholinitis, rectitis, peritonitis, cystitis (rare) conjunctivitis and arthritis.

The family represents, therefore, the greatest danger to those children who come in contact with these infected girls, the servants, and finally five percent. of attempted violation by vaginal or anal methods. Want of hygiene and masturbation play an important role.

SIMPLE BRONCHITIS IN CHILDREN.

BY H. GILLET, (*Bulletin de Therapeutique*).

Every bronchitis may be the starting point of a broncho-pneumonia; this complication is all the more to be feared if the child is very young, whether it refers to a nursing baby, a weakly child, or one submitted to artificial feeding, or with a hereditary, syphilitic, or rachitic family history, or with old digestive troubles which have become chronic. If the child coughs and if it has fever, it should be kept in the house, wool socks should be put on, and the apartment should be vaporized with eucalyptus, oil of turpentine, tincture of benzoin, or simply eau de cologne; temperature should be maintained at 18° C.

At the beginning, an emollient medication is desirable. In nursing children one may prescribe:

℞	Syrup de Capillaire	20 grams.
	Syrup de fleurs d'orange	40 grams.

Every two hours, one or two teaspoonfuls, and infusion of grinaude flowers, or one may give to some advantage, the following mixture:—

℞	Bicarbonate of soda Benzoate of soda	aa 1 gram.
	Orange Flower Syrup Distilled Water	aa to make 40 grams.

Dose: One or two teaspoonfuls every two hours. If the child is on a mixed regimen, it should be returned to the breast.

A slight counterirritant with mustard leaves left on a short time and carefully watched, on account of its action on delicate skin of nursing children. In case the bronchitis is wide spread, warm baths may be given with caution; in acute cases, antispasmodic and expectorative medication may be necessary.—(From *Union Medicale du Canada*, Nov., 1909).

BOOK REVIEWS

Essays Concerning the Influence of the Visual Function, Pathologic and physiologic, upon the health of patients, by George M. Gould, M. D. Volume VI, 471 pages, cloth bindings, price $1.00. P. Blakiston's Son & Company, Philadelphia, Pa.

The sixth volume of Dr. Gould's biographic clinics is just off the press, terminating a series begun in 1903. In these volumes the author set out to prove his theory that defective vision and eye strain are factors which affect the lives of individuals, and that the malady even affects the characters of great men. The author enforces his unique manner and presents his deductions in a controversial style regarding the far reaching influence of eye strain.

The essays composing this volume prove that the author is an acute, enthusiastic erudite scholar who has the happy faculty of recording accurate observations, which he depicts in such manner that mankind is benefitted by his studies of this subject. A cursory glance at the chapter headings shows how thoroughly he has studied his subjects while reviewing the field of eye strain. Among other subjects he considers, "Eye strain, its cause and its effects," "Remarkable case of Epilepsy cured by 'eye strain,'" "The myth and mystery of Menier's Disease," and "Ophthalmovascular Choke."

Doctor Gould looks upon his life work from a philanthropic point of view and carefully studies each individual patient, with a view of doing the greatest good to the greatest number. The chapter on "Varieties of Medical and Ophthalmic blunders," which may be and are made by the ignorant practitioner is a splendid appeal for the welfare of the poor patient which is uppermost in the mind of the author, who holds that humanity is more important than science and that the patient must never be sacrificed for the so-called advancement of learning.

Diseases of Infants and Children. By Henry Dwight Chapin, A. M., M. D., Professor of Diseases of Children, New York Postgraduate Medical School and Hospital. And Godfrey Roger Pisek, M. D., Professor of Diseases of Children, University of Vermont. Octavo, pp. 624. With 179 illustrations and 11 colored plates. New York: William Wood & Co. (Cloth, $4.50 net).

A book on any medical subject written by these versatile and accomplished authors and teachers is sure of a cordial reception at the hands of the medical public. Doctors Chapin and Pisek from their long experience and close contact with students, both graduate and undergraduate, are familiar with the needs of the student and general practitioner, and have produced a text-book presenting a picture or description of diseased conditions as they actually occur at the bed side. The authors have steered straight, taking a middle course between the compendium volume, which is generally unsatisfactory, and a too exhaustive work which, by too much theorizing tends to confuse the student.

This handsome volume embraces a full and complete knowledge of pediatrics, written for both students and practitioners. It is a well balanced presentation of pediatric science and experience. The authors devote sufficient space to etiology and pathology, leading up to a full consideration of the more directly practical subjects of diagnosis, including differentiation and treatment. The section on infant feeding presents the latest information on the subject, and in a manner that is simple, easily grasped and readily put into practice. There is a truism in the statement that food "may be chemically right but practically wrong" and that "each infant is a law unto itself except concerning the form in which it prefers its food." The chapter on the treatment of epidemic cerebrospinal meningitis is a satisfactory resume of the latest teaching on this subject, lumbar puncture and the hypodermatic injection of Flexner's serum through the anterior fontanelle. In truth this is a text-book for the general practitioner, very explicit in instruction on the doses and uses of drugs, and offers the well informed medical man a repertoire of the science and art of pediatrics. The publishers realize the great worth of the volume and give to it all the art in bookmaking for which they are justly famous.

PEDIATRICS

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EDITORIAL

SOME OF THE NEUROSES OF EARLY LIFE.

In this issue we are publishing a paper on “The Nervous Child,” from the pen of one of our esteemed collaborators, E. H. Bartley, M. D., Prof. of Pediatry, Long Island Medical College. His portrayal of the various nervous diseases of infancy and childhood is exceedingly instructive, very comprehensive and easily grasped. Doctor Bartley discusses both scientifically and sympathetically, the neuroses of early life.

He starts in by saying, "the neurotic child of today is the neurastheniac of tomorrow," and defines neurasthenia as irritability and exhaustibility of the whole cerebro-spinal nervous system, and perhaps of the sympathetic nervous system as well.

Doctor Bartley believes that the unrest and excitement of the present day have told upon both men and women and upon their offspring, and that a neurotic heredity is more common than ever before. To combat this heredity it is necessary to recognize it early in individual cases, and then to surround the child with wholesome and powerful personal influences.

Among the essential characteristics of neurosis or psychosis in a child the author notes the following: 1. Want of coordination in muscular movements, both reflex and voluntary. 2. Hyperesthesia of motor or sensory centers, a slight stimulus provoking a strong reaction out of all proportion to its strength. 3. Failure of inhibitory control over actions or reflex movements. 4. Exaggerated conscientiousness and contrariness. 5. Certain morbid habits not seen in normal children. 6. Tendency to *petit mal* and hysterical attacks.

At the very outset of life we may find difficulty in respiration and deglutition due to faulty coördination or to failure of inhibition, and later on the nocturnal bed-wetting, which persists in older children, "strongly suggests a developmental failure of the controlling nerve centers which coördinate micturition." Head-shaking, nystagmus and stammering are also grouped with this class, and are apt to be confirmed by habit. Another group of neuroses of the lower neurons, apt to occur in neurotic families and to appear early in life includes such diseases as spasmodic asthma, recurring fever and recurring vomiting.

Among the minor mental abnormalities associated chiefly with the higher centers we find that undue sensitiveness to impressions which is evident in some very young infants who wake at the slightest noise or discomfort. An excessive timidity throughout infancy and childhood characterizes these children: fear of strangers, fear of the dark and of all sorts of uncanny creatures with which their imagination peoples it. Occasionally they are also subject to hallucinations occurring in the daytime.

Other children exhibit a contrariness difficult to manage, and apparently find their greatest delight in disobedience. This is often a passing phase, and less to be dreaded than a certain want of control over desires which lead the child to purloin toys, sweets, etc., without any sense of shame, and if not outgrown and *out-educated,* if the word is permitted, may consign him to the life of a criminal. In contrast with these are the children who exhibit a morbid dread of committing some fault, and even at times accuse themselves of those which they have not committed. All these abnormalities are unfortunate and require the most wise and tender care, but where such care is forthcoming and there is no evidence of *petit mal* the outlook for the future is still sufficiently hopeful.

The morbid habits which characterize some children are rather more serious, such as masturbation, dirt-eating, a tendency to eclampsia, marked destructiveness, impulses to scratch and bite, and cruelty to animals. In many cases where the children seem otherwise normal these habits are broken or outgrown with advancing age, but where they persist the future is none too promising.

The close relation of infantile convulsions, hysteria and the various forms of epilepsy is constantly emphasized in early life, and it is to be noted that slight fits with no complete loss of consciousness, merely a stumbling, perhaps, or the making of grimaces, are often regarded by parents as merely "tricks." These minor fits are often more or less under control of the individual, and children have been known to use them as a weapon wherewith to rule the family and accomplish their desires. A judicious ignoring, together with a sharp scolding and a little cold water, can often break up this tendency.

All these minor neuroses are warning signals which, if disregarded, may lead to disaster, but if taken in time and wisely treated, may result in no serious disability. The best "cure for the neuroses of the twentieth century child is hard work and hearty play, a simple and healthy life."

ACUTE ANTERIOR POLIOMYELITIS.

There have been several epidemics of this somewhat obscure disease on this continent within the past few years. Although there are still many moot points in regard to its etiology, diagnosis and treatment, a considerable amount of illumination has been thrown on the malady. For instance, it is allowed to be of microbic origin, albeit the causative germ has not as yet been isolated. Dr. Le Grand Kerr as the result of recent investigations in Brooklyn, concluded that the disease is a hematogenous infection with a microbic agent of low virulence, that this infection is grafted upon a tissue susceptibility acquired through the agencies of local malnutrition, exhaustion and nerve impairment and that the most favoring factor of all is an individual susceptibility over which we have no control, which meant that it is not highly infectious, but attacks those who are thoroughly run down or lacking in vitality, and that there are certain children who are predisposed to the infection. Drs. Joseph Collins and T. H. Romeiser, writing in the *Journal of the American Medical Association*, May 30, 1908, conclude that the infection which causes the disease finds the entire central nervous system and its coverings susceptible. The gray of the anterior horns is merely the most susceptible or the most perishable under its influence. The remainder of the brain may be affected, but rarely beyond the state of irritability. Collins and Romeiser are not in accord with the view that was popularly held, that no cases of acute anterior poliomyelitis made a good recovery. Their experience was that many cases make a fair recovery.

Dr. H. Climenko decided that the disease is due to a toxemia and that since 43 per cent. of the cases which came under his observation showed gastro-intestinal disturbances, the gastro-intestinal canal was the probable port of entry. With this view, perhaps most authorities are in agreement. Diagnosis in the early stage is by no means easy. It is not unlikely that if diagnosis could be made promptly, and effective treatment given, that the course of the disease would be far more favorable, and in some instances possibly aborted. As to treatment, the consensus of opinion seems to be that at first free purgation should be obtained, the drug to be used preferably calomel. Hot fomentations and in some cases cupping wet or dry or leeches are indicated. Toxin elimination may be hastened by hot baths and packs and the ingestion of large quantities of hot water. When the administration of belladonna and ergot is called for, these remedies should be administered in full doses. It is encouraging to learn that the experiments being carried on by Drs. Flexner and Lewis in regard to the origin of epidemic poliomyelitis are proceeding in a satisfactory manner. An epidemic of acute anterior poliomyelitis is reported from a country district of Ontario. The Ontario Provincial Board of Health are investigating the matter carefully, and it is to be hoped that some new facts may be gleaned. Until more is known of the disease, but little can be done in the direction of eradicating it or of even successfully staying its spread.

ETERNAL VIGILANCE THE WATCHWORD IN PEDIATRY.

Particularly in pediatric practice, the educated practitioner will be on his guard against useless and irrational therapeutics. In an untried constitution, he will begin with small doses and repeat them as needful. The result will be quite as sure, and the uncertainty not half so risky. He will give his coal-tar antipyretics with great circumspection, and be sure that his Dover's powder was compounded by a careful apothecary. He will not be satisfied to leave important surgical work for the nurse to undertake in his absence. She may, with the best intentions, irrigate the baby's lung instead of his stomach, or by soiling the catheter on an ill-washed gown worn with her last case of puerperal sepsis, excite a fatal cystitis. He will not forget that the popular Latin maxim about the reparative power of nature is oftenest true in children, and that a minimum of interference is called for. He will not even give a calomel triturate, till the case has been examined, and at least a probable diagnosis made. At the same time he will know that sins of omission are punishable. He will not tell the mother that the baby's running ear will "stop of itself," nor give borax-water for trachoma, nor let the croup-case be moribund before attempting intubation. "Eternal vigilance" will mark his professional walk and conversation, and only eternal vigilance will save him, as time goes on, from many a moment of poignant self-reproach.

ON THE ROUTINE EXAMINATION OF THE ACCESSORY CAVITIES OF THE NOSE AFTER ATTACKS OF SCARLATINA AND OTHER INFECTIOUS DISEASES OF CHILDHOOD.

The ravages produced in the middle-ear by scarlatina and its congeners are understood even by the laity; but the possibility of similar invasion of the nasal sinuses in childhood is ignored by the majority of physicians. Autopsies upon the bodies of children dead of scarlatina, measles, whooping-cough, and influenza have frequently shown the existence of sinus suppuration, due to the extension of the specific rhinitis into those accessory cavities. Doubtless in many cases of this sort spontaneous resolution of the local mischief accompanies the recovery of the general health. We know, besides, from autopsies that suppuration of the sinuses may be present in certain cases without the suspicion of its existence during the life of the patient. But as the etiology of chronic intra-nasal diseases (a number of which date from childhood) is in a very unsettled state, it behooves us not to lightly disregard any agency which might contribute to the production of these affections. What do we actually know of the causation of ozena, adenoids, polypi, and empyema of the sinuses? Is it not extremely probable that a residual purulent focus in the nose would be able to contribute prominently to the production of these affections? The statement is frequently made that the sinuses of children are undeveloped, and doubtless some harm is done by repeating this generalization as if it were an axiom. The statement is, of course, approximately true of infants in the very first years of life, but applies in no wise to children at the age of eight or ten years. It would be a commendable routine practice for the family physician to bring about a careful examination of the condition of the sinuses after every severe attack of any of the infectious diseases indicated above in children who have passed the period of second dentition.

AMERICAN ASSOCIATION FOR THE STUDY AND PREVENTION OF INFANT MORTALITY.

The task of preventing infant mortality is second to none in importance and should engage the best attention and effort of all individuals, lay and professional; and of every commonwealth and community. With this idea The American Academy of Medicine called a conference on Prevention of Infant Mortality, held November 11 and 12, at Lampson Hall, Yale University, and "The American Association for Study and Prevention of Infant Mortality" was organized at a special meeting, called at the close of the Conference and held on Saturday morning, November 13, in Lampson Hall. Dr. F. H. Gerrish of Portland, Maine, presided and Dr. Charles McIntire acted as secretary. A constitution and by-laws were adopted and the following officers were elected: President, Dr. J. H. Mason Knox, Jr., Johns Hopkins Medical School; 1st vice-president, Prof. C. E. A. Winslow, Biologist-in-chief of the Laboratory Research, Mass. Institute of Technology, Boston; 2nd vice-president, Mr. Homer Folks, Secretary of the New York State Charities Aid Association; secretary, Dr. Henry I. Bowditch of the Harvard Medical School, Boston; executive committee, the officers and Dr. Mary Sherwood, Baltimore, Maryland; Dr. J. S. Neff, Director of Public Health and Charities, Philadelphia; Mr. Robert W. Bruere, New York; Dr. Helen C. Putnam, Providence, R. I. and Dr. John S. Fulton, Secretary-general of the International Congress on Hygiene and Demography, Washington. It was decided that the board of directors should number at least thirty members. The complete number was not appointed, the directorate being authorized to elect additional members at a later meeting. Those appointed included Dr. H. Merriman Steele, of the Yale Medical School; Dr. Charles Richmond Henderson, Professor of Sociology of the University of Chicago; Dr. F. H. Gerrish, of Portland, Maine; Dr. J. Morton Howell, Health Officer, Dayton, Ohio; Dr. John M. Connolly, of Boston; Dr. H. J. Gerstenberger, of Cleveland; Prof. Isabel Bevier, of the University of Illinois; Dr. W. H. Carmalt, of the Yale Medical School; Dr. Thomas Morgan Rotch, of the Harvard Medical School; Prof. Irving Fisher, of Yale University, President of the Committee of One Hundred on National Health of the American Association for the Advancement of Science; Dr. Caroline Hedger, of the United Charities of Chicago; Dr. W. E. Evans, Director Chicago Department of Health; Dr. Lillian Welsh, of Baltimore; Dr. J. F. Edwards, Department of Health, Pittsburg; Dr. Richard A. Urquhart, of the Johns Hopkins Medical School, Baltimore; Dr. Charles P. Putnam, of Boston; Dr. Thomas Darlington, Health Commissioner of New York City.

Baltimore was selected as the meeting place of the society. The meeting will be held in the autumn of 1910. Dr. Charles Richmond, of the University of Chicago, was nominated president for 1910-1911.

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ORIGINAL ARTICLES

THE MODERN PHYSICIAN AND HIS LITERATURE.*

By Le Grand Kerr, M. D.

Professor of the Diseases of Children in the Brooklyn Post-graduate Medical School; Visiting Pediatrist to the Methodist Episcopal (Seney), the Williamsburg and the Swedish Hospitals in Brooklyn, New York.

The Facts.

In every realm of human activity and thought it is common to find that rapid advancement is made at the cost of known values. With the substitution of the new for the old, of the up-to-date for the out-of-date, there comes the relinquishing of things that were useful and had valued associations. And occasionally things are laid aside which make us stop and question for the moment, as to whether the new is really an advancement.

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* Read at the annual meeting of the Association of American Teachers of the Diseases of Children, Atlantic City, June 7, 1909.

"New occasions teach new duties;
Time makes ancient good uncouth;
They must upward still and onward,
Who would keep abreast of Truth."

Coincident with the demands of a higher education in medicine, a lengthening of the course of study and the more stringent requirements for admission, there occurred the gradual passing out of a valued factor in medical education: the preceptor. With the passing of the preceptor there arose the necessity of a larger literature and while in some instances it might be shown that the passing of the preceptor was the result of an increased literature, it still remains a fact that in most instances, the demand for a larger literature was in part a result and not the cause of his passing.

And yet the place of the preceptor can never be completely taken by the literature. No matter how complete it may become, it must teach the student to meet his patient as a trained scientist and not upon the plane of personal contact.

In medicine, the study of men necessarily precedes the study of books and the opportunity formerly offered to the student of seeing patients with his preceptor and observing the solution of problems thus met was a valuable preliminary training. The relation of a physician to his brethren, the principles of professional etiquette, the duty of the doctor to the public and the kind of literature to read were all early inculcated into the mind of the young student and became a part of his after life and study.

The graduate of today is lacking in this instruction; the personal side of the physician's art is to him an unexplored field. Even internship in a hospital has not proven a satisfactory substitute. But unquestionably the largest factor in the increase in medical literature is the rapid advance which all branches of medical science have made. This advancement has been contributed to largely by three elements of workers: the laboratory worker, the clinician at the bedside and the student at his books.

While it is desirable that these three classes develop harmoniously, this has not been the case. There has always been a tendency to exalt the efforts of the laboratory worker rather to the detriment of the other workers. This no doubt has been brought about largely through the influence of the literature coming from the laboratory for such writings of necessity have in them an element which strongly suggests originality. But is the ferreting out of the laws of injurious effect which harmful agents may have upon all members of society more original than the practical application of such research at the bedside? The value of the literature produced by the laboratory worker depends upon three things: accuracy of observation, a mind free from prejudice and open for impression and the ability to report correctly. It is a rare thing to find these three qualifications embodied in the same individual and the result is that much of the experimental work which is done is of small value until it has been analyzed and re-analyzed by others than the original investigators. Now when reasonable deductions have been formulated from laboratory experimentation they must be proved in practice, so that the clinician becomes a strong factor in medical advancement and the literature of the bedside worker has a very distinct value.

The writings of the clinician must always remain less spectacular than those of the laboratory worker. Their value lies chiefly in the fact that they are the record of an actual clinical experience. The writings of the clinician need not be original for a real experience stated without prejudice has the element of success about it, even if that experience only added weight to already known facts. There is one danger about the writings of the clinician, however: with close specialization there is apt to come a biased view and this must be guarded against. Much of the literature of the clinician is original, a large part is suggestive and as the record of clinical experience it should be heartily welcomed.

The writings of the student are usually of great value. This sort of literature is not always given the credit which it deserves. In the busy search after new things there has been the tendency to neglect the underlying principles and truths which have existed in medicine for many years. Some check must be placed upon this tendency and this is largely the work of the student. He delves into his books and often brings again into prominence those things which are essential but which have been laid aside owing to the attractiveness of new ideas. In this search for truths, the student cannot be unmindful of the men who were back of the truths and so occasionally, but not as frequently as we should have them, we are treated to the biography of the medical men who have accomplished things in the past. It is unfortunate but still a fact that the history of medicine is a much neglected field. Another important work of the student is to correlate the literature of the laboratory and the clinician.

The form taken by the literature of these three classes of workers is varied. But without going into unnecessary detail, these may be classed under three headings: the text-book, the periodical and the medical index. The text-book is the most commonly used of all the forms of medical literature both by the student and the practitioner. This is no doubt due largely to the fact that it is a record of the experiences which occur in everyday practice and as such appeals to the large body of practitioners. This gives a definite value to the text-book. But it also has its many disadvantages. It is soon out-of-date, as new editions are demanded to keep abreast with rapid progress. It is bulky and costly. This latter disadvantage makes it impossible for the mass of practitioners to own more than one text-book upon a given subject and that one book is to him an authority. This is not conducive to healthy, intellectual growth. There is a type of arrested mental development which comes by taking all things for granted merely because some particular person or a certain book says so.

And yet it is a most difficult matter to place a definite value upon the place of the text-book in medical literature because we must recognize the fact that knowledge which may be superfluous to one is a necessity for another. The fact is that a particular man is helped by the literature just in the measure that he is capable of assimilating it. It is the author's statement coming into contact with the experience of the reader and the two meeting in unison or antagonism which makes for good. This blending of what the author writes and what the reader thinks makes a new combination and as this new product is brought into actual practice it becomes of value. As a man's knowledge of the underlying truths of medicine grows, his need of the text-book decreases. The periodical when well selected is really the backbone of medical literature. It can be kept filled with articles which represent the best and most advanced thought of the day and this can be brought to the reader within a short time. The general periodicals can bring to the man in general practice the details of medical advancement and current thought and to the specialist a knowledge of the things which do not pertain directly to his specialty but which are always allied to it. The special periodical is capable with careful editing of bringing to the specialist the best that his co-workers can offer and to the general practitioner it gives in fullest measure that knowledge for which he may be seeking upon some special subject. There is one common disadvantage of the periodical. The knowledge which it contains is not always required at the moment and it is filed away in an inaccessible form. Six months or a year may pass before an index is available to aid in the ready reference to a given article. Much value is added to this form of medical literature if the reader makes his own index. This can be very readily done as will be suggested later.

There is another thing which the editor of the periodical owes to his readers and that is an acquaintance with the author of each article. The reader has a right to know the titles and appointments of the writer of each paper for this is a partial means of identification. Under the guise of modesty, some men simply associate their name with the article but the reader has a right to know more than this; he has a right to judge for himself of the man's opportunities for observation. One cannot fail to recognize that some writers start out with the deliberate intention of gathering data which will support some preconceived idea. In the accomplishing of this, the facts which are corroborative are emphasized and all others are given false values, so that the conclusion reached is not one that is logically deducible from the facts as they stand, but is a personal opinion based upon some but not all the facts. In a word, there is an attempt to make the opinion of the writer as an authority stand higher than the authority of facts and the result is an inharmonious clash of authorities, each promulgating his own particular hypothesis. Medical literature needs more statements of fact and less of personal opinion. Here is the opportunity of the medical editor; he should most carefully select or reject the material submitted to him. In addition, the selected material should be carefully edited and if needs be the title should be reset. It has been said in criticism of the periodical that much of the material is mere compilation, but this does not detract from its value. The writer who resurrects the experiences of others and puts these experiences in the best form for assimilation by the busy practitioner does a large service. In fact this is the kind of literary work for the younger men, the men who lack clinical experience but who have plenty of spare time. I consider this type of work of a very high order because it offers little or no pecuniary reward, tends to bring into prominence the underlying truths in medicine, adds to the knowledge of the investigator and places the varied experiences of several clinicians and laboratory workers in a state which favors assimilation by the general practitioner.

The medical index is a most important part of our literature. Let us take for example the highest type of this form: the Index Medicus. Owing to the indefatigable energy and scientific spirit of Dr. J. S. Billings, this index has attained a position which no text-book ever written or periodical ever published can hope to equal.

There is no other form of literature which has done so much to make medical advancement possible.

But that it may do its greatest amount of good there must be access to the writings referred to. This place is filled by our medical libraries. The medical library occupies a peculiar field differing from all other such institutions. In law, they live largely by precedent; the decisions of today are usually based upon and must harmonize with the decisions rendered years before. In theology there exists no real need for ready access to doctrinal works; success can come without them. But in medicine the reaching out is not alone into the past but into the future. We must know and read the writings of the original observer. Such writings are in many instances a far more reliable record than the literature of more modern days. The past should be compared with the present and with the possibilities of the future. It is not enough to know the underlying principles which have been recognized for years, the modern physician must be acquainted with today's great under-current of thought which is influencing scientific medical advancement. To be abreast of the times, he must identify himself with it and must be cognizant of the drift of the ideas which are shaping that advancement. Medical literature is a live and ever-growing thing and the modern physician must have access to all that it affords, both of the past and the present. And this is the need that the medical library supplies. With its carefully compiled and verified bibliographies and its indices, it places within ready access all of the literature required by the modern physician.

These are the facts.

What Is the Need?

The need in medical literature is for instruction and a better understanding as to how to collect and use the literature.

With such instruction there would follow the supplying of other needs. The value of the literature and also the relative values of different types of the literature would be appreciated. One would learn how to correlate one's reading so as to advance practical medicine. With the facts in mind and the need appreciated,

What Is the Remedy?

There should be some provision in every teaching institution of medicine for instruction in the personal relations of the physician to the patient, the public and his profession. Such instruction would not require many hours and the time would be well spent.

We have referred to the three classes of workers. The profession must ever bear in mind the influence exerted by each set of workers and do nothing which will tend to exalt the literature of one over the other. If medical science and its literature is to advance in a manner which will insure its permanency and saneness, the three classes of workers must develop in harmony. When the literature of one set of workers is exalted to the detriment of the others, the line between justice and wrong has been overstepped. There should be less and less dependence placed upon the text-book and upon the opinions of authorities. Authorities may be quoted and their opinions given a certain amount of recognition, but the real authority in any given case is the man in charge and the too ready acceptance of every opinion and statement of an authority soon vitiates individual effort and reasoning.

As less dependence is placed upon the text-book more must be placed in the periodical. But to make this constant stream of new material readily available there must be some means of ready reference. Until such time as this is regulated by the publishers, each man must make his own index. I shall give a brief statement of my own method which may be suggestive. As an article is read in a periodical, markings are made at the margin which indicate for ready reference the points referred to. These arbitrary markings are as follows: "Pa" in the margin shows that that paragraph of the article refers to the pathology (including bacteriology), "Pr." to prevention, "D" to diagnosis, "E" to etiology, "S" to symptomology, "T" to treatment. If the article has been worth reading it is worth referring to again and the subject is carried to a card which contains the name of the periodical, its date and page. These cards constitute my index. Suppose that I am interested immediately in the subject of "Rheumatism" and particularly so in its symptomology. I look up all the references on the card, take those of later date and without having to read the whole article, I look for "S" in the margin. In this way a large amount of time is saved and if there is no marking in the margin, it reminds me that I was not impressed with that section and it may be ignored.

Charles Lamb thought that the proper way to educate a person was to turn the individual loose in a library of well selected books and leave all to individual choice. But would this procedure be safe for the student in medicine? Decidedly not. The taste for the best of scientific reading is a matter of training. If left to himself or if uninstructed as to how to proceed the student of medicine will inevitably gather the tares as well as the wheat. It is too serious a matter to leave unguided. There is a real need that the student be taught the value of medical literature. With an appreciation of its value should come instruction in its proper use; the physician should be taught the use of the various indices and particularly the Index Medicus and the Index Catalogue of the Library of the Surgeon-General's Office. Instruction should be given as to how to look up references and especially how to make a good selection of such references when found. Such instruction in regard to medical literature and its relative values would be the means of making the labor of research easier and would tend to lessen the expense which comes from buying unnecessary literature. The question properly arises as to whose duty it is to provide this instruction. I think that all will see the propriety and practicability of the medical college providing the same and this might with distinct advantage be added to the curriculum. But a small proportion of the medical profession make any use of the large medical libraries. This is not surprising. They have never been taught its value and even when they are awakened to the possibilities, they are not properly equipped to use the material offered. Even of the minority who do use the library, but few are capable of gleaning what they wish without the aid of the librarian. If we have these powerful influences for good, they are only of service in so far as we teach men to make use of them.

He who would enter into the realm of medical wisdom must first throw off all intellectual pride and become as a child receptive to new impressions. Prejudices, preconceived notions, unstable beliefs; these are all obstructions to true wisdom.

Opinions born of pride or not based upon facts are always suicidal in their trend.

It is only by an appreciation of what others are doing and giving them credit that we may hope to add our part to the general advancement. It is by an appreciation of the value of medical literature that the modern physician becomes in love and in league with the best that is in the literature, and as a consequence, the best in literature becomes in love and in league with him. It aids him at every point; it smooths out his difficulties; he has learned to use his literature and it has learned to use him for the uplift of mankind and the relief of human suffering.

ON THE PERSONAL RELATION OF STUDENT AND TEACHER.*

By Edward J. Wynkoop, M. D.,

Syracuse, N. Y.

Associate Professor of Pediatrics, College of Medicine, Syracuse University.

Realizing the responsibility that rests on those who teach any branch of medicine, it is with considerable trepidation that one approaches a topic of this kind.

Knowing full well that there is little that can be brought to your attention that you are not perfectly familiar with, it is the thought that possibly some things contained in this short paper may provoke a discussion and bring more forcibly to mind a realization of the importance that personal contact means to student as well as teacher.

Some of you may be so situated that your work in the medical college extends through the third and fourth years, but in many colleges the time allowed for teaching Pediatrics, and other important subjects is confined to the fourth year and sometimes only a part of that.

And here let me register a protest against relegating medical and surgical diseases of infants and children "the bone and sinew" of general medicine and surgery, to such a short and cramped collegiate career.

It has always seemed to me that the most important subject, especially for the young practitioner to be well versed in, was the diseases of infancy and childhood. As a matter of fact, there is probably no subject which is harder for the average student to grasp, and in which, when he first attempts a practical demonstration he fails so utterly, as this.

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* Read at the annual meeting of the Association of American Teachers of the Diseases of Children, Atlantic City, June 7, 1909.

Whether in the line of infant feeding, the early recognition of some infectious disease, or even the early warning of a Potts or hip joint trouble, he is usually found inadequate.

Two-thirds of the hurry calls that occur in private practice are for babies or children suddenly taken sick or hurt, and a large majority of these calls are answered by the young fellows just starting in, because the regular attendant is usually out on his calls and can't be found on the instant. See what it means for a young man to be thoroughly competent in this department.

The hospital, the dispensary, the class room, are and always will be the principal place from which the student obtains the bulk of his training, and the teacher the best opportunity to find out how much of that knowledge he is absorbing. But even with well conducted clinics and quizzes, do we get in as close touch with our students as we should? Will not more effort on the part of the teacher to come to closer personal contact with the student be not only a benefit to the student but to the teacher as well?

Possibly in the small classes with frequent quizzes and clinics, we get somewhat better results than in the old lecture days, but do we really get hold of the students and really know just what benefit they are deriving from *their* work as well as ours?

Are we not too often content to carry away with us the classroom impression of a student and have absolutely no idea of his personal work, or of his ability?

How many times do students come before us for their final examinations, when we find that if it were not for our classroom record book, any idea as to their identity, would be exceedingly difficult?

This is wrong, it is neither fair to teacher nor student.

When a student has completed a four years' course and during a part of that time has been in the class room and in the hospital clinic under our supervision, he should come before the examining committee, well known as to personality and ability.

Personal contact with a class numbering thirty or forty, or possibly more, seems rather difficult but it can be managed by some systematic effort. A great deal can be accomplished with meeting small groups of students at hospital and dispensary and as this is now being done to a great extent, this paper will refer to the opportunities that can be utilized outside of college, hospital, or dispensary, to get in closer personal relations with our students.

The assigning of students to office work can be made a great help. There is no reason why many cases that are brought to the office cannot be utilized to demonstrate before three or four students certain important conditions.

It would not be a difficult matter in our daily practice to select cases that could be utilized at the office for teaching to small sections of the class. For example, a twenty minutes discussion and talk to three or four students and the presentation of the patient, just before or just after office hours, could be made an excellent means of getting in close touch with the student. Some would object owing to the already crowded hours, but I believe the time is ripe for saying to those in authority, we shall be crowded no longer, we insist upon more time for teaching Pediatrics.

There are a good many instances where students can accompany the attending physician to the patient's home and there come in contact with some of the important details that are necessary to make a successful practitioner.

If our well-to-do patients object to an occasional student visit, we all of us have cases among the unfortunates who are ready and willing to allow the attending physician any favor.

In combination with dispensary work, visits can be made to the patient's houses by students, and interesting cases seen, or some of these dispensary cases can be brought to the office for further observation and later the cases followed up at their homes. It does not take long to pick out the industrious student and very often one is surprised as to whom the really industrious ones are.

Then lastly, let us cultivate more the social side to bring the students in closer touch. There is one prominent school where certain members of the faculty invite to their homes, a section of the class each Saturday night, and then the cases assigned in hospital or dispensary are discussed and the students meet their teachers on an even footing. This is where the personal element counts and where the student feels that someone has an interest in his welfare. Think what such an evening means to six or eight students when for two hours or so the cases are discussed, questions are asked, and everything is done to interest the student in his work. Here also is a golden opportunity for the teacher to suggest books that he has found helpful in the study of children. Think what it means to some of these hard working fellows who are struggling to secure a good training many times with few friends and acquaintances near.

It has often seemed to me as man after man presents himself for examination, what do I really know about him? Am I right in supposing that he has grasped one-half of what I have tried to teach him?

I believe it is a teacher's duty to try to come more in direct personal contact with his students. The thought often comes to me, as I hear of different graduates of our regular schools entering upon careers outside of ethical medicine, that possibly some of the teaching is at fault rather than the men.

Commercialism in its various phases finds oftentimes fertile soil, yes far too often, in our young graduates. Certainly personal contact of student and teacher cannot but strengthen ethical medicine. Whether it be division of fees, common advertising, criminal abortions, or any other pursuit, many a man has entered a field of this type simply because he was started wrong.

What has been suggested in this short paper means a great addition to the work of the head of the department and whether these suggestions form a practical working basis or not, is not the object of this paper.

My aim is to bring, if possible, before you, a realization of the importance of the personal relation of student and teacher, and to enter a plea that as teachers, we have other duties and responsibilities than those of simple class room work.

THE NERVOUS CHILD.*

By Dr. E. H. Bartley,

Prof. Chemistry, Toxicology and Pediatrics, Long Island College Hospital, Brooklyn.

The "nervous child" is more commonly met with today than formerly. They are more common in large cities and in highly cultured families than in the country and in the families of the poor. The neurotic child of today is the neurasthenic adult of a few years hence. Indeed the neurotic child may easily become a neurasthenic child; for neurasthenia is not a rare occurrence in childhood. Nervous instability and nerve exhaustion as we all know is the cause of a vast deal of suffering, and one of the most troublesome conditions we are called upon to treat. Many of these nervous children are seldom brought to us for treatment of this condition. When they are brought to the family physician they are too often dismissed as subjects of imaginative ills, or as simply nervous, only to be allowed to worry along to adult life without assistance. The neurotic child may be so from inheritance, or he may be made so as the result of environment or some accident of illness. Thus, we occasionally meet with one in a family of several perfectly normal children of normal parents. This fact has led to the oft quoted saying that there is a black sheep in every flock. The black sheep in a large family is usually the result of a neurotic child which, under the training accorded the brothers and sisters develops traits that are ruinous.

Perhaps if that one could have been removed from the rest of the flock and judicially managed, it might have been led into a very different channel. Neurotic children are peculiarly susceptible to their surroundings. They vary greatly in their peculiarities, but all are abnormal in some respect, and require intelligent management. Their unstable nervous system is easily disturbed and easily exhausted, leading to neurasthenia. Neurasthenia may be defined as an irritability and easy exhaustibility of the whole cerebro-spinal nervous system, and perhaps of the sympathetic nervous system as well. Neurasthenia, then, may be the result of the neurotic temperament subjected to unfavorable surroundings, as domestic mismanagement, insufficient sleep and exhausting exercise. The early recognition of these cases may do much to better their condition and save them from a life of misery, their parents from much trouble and the community from at least some criminals; for as I believe some of those neurotic children are very liable to develop in this direction.

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* Read at the annual meeting of the Association of American Teachers of the Diseases of Children, Atlantic City, June 7, 1909.

Symptomatology. The neurotic child possesses an abnormal capacity for feeling emotions and sensations, emotions and sensations easily aroused by stimuli which in the normal child would be inadequate to produce such results. Consequently trivial physical stimuli, such as peripheral irritations or slight ailments, produce grave nervous disturbances more lasting than in the normal child.

Probably the earliest symptom of the neurotic child is an abnormal tendency to fright. The unusual fright at the sight of a stranger, the fear of falling exhibited by certain children, or the fear of the bath, sudden starting at a slight noise, intense fear of the dark, etc. Continuous crying night and day, with very little sleep, and without evident cause is another early symptom.

Sometimes slight muscular twitchings may be produced by gently tapping any portion of the body. In neurasthenic children there is apt to be an increased tendon and periosteal reflexes, while the skin and muscular reflexes are normal or decreased. Other symptoms are diminished corneal reflex, alternating inequality of the pupils, tremor of the eyelids, high blood pressure, 110 mm. of mercury or above, changes in the pulse rate, sudden changes in the color of the face or neck, with fleeting erythema.

Defects of speech are not uncommon, such as noisy, hurried speech, stuttering or stammering. Nocturnal or even diurnal enuresis is sometimes a symptom of nervous exhaustion. Again we see spasmodic seizures of coughing or vomiting brought on by unpleasant mental impressions, or disagreeable sights or tastes. These may be brought on by attempts at discipline, by urging the child to eat what it does not want to eat, by the thought of going to school or of doing anything it regards as not entirely agreeable. Cardiac palpitations, arythmia, vertigo or syncope, of physic origin are not rare symptoms in older children. Nervous headaches, so-called, especially after the age of five or six years are frequent and distressing. These may be brought on by the troubles of school life, anxiety over lessons, sitting in an insufficiently ventilated room or anything that disturbs the nervous system, even without eye strain. Such headaches usually disappear after the school duties are over for the day, and especially after a few minutes of play in the open air, unless the cause has made a profound impression on the nervous system; then the headache will usually persist until the child falls asleep.

The neurasthenic child has very little endurance, either mental or physical. He easily tires of anything which requires sustained effort or attention. His interest is easily exhausted and he falls back in his studies, not because of lack of intelligence, but from lack of endurance. This failure to maintain his rank with others of his age is soon felt by his sensitive nature, which discourages him and adds to his difficulties. He soon dislikes the school and the teacher, and goes from bad to worse.

Anorexia or an abnormal or capricious appetite is very common in such children. Indeed, it is unusual to see a neurasthenic child with normal appetite and digestion, and therefore a normal nutrition. It is often a matter of great concern with the parents and with the physician, how to keep up the nutrition of these children, because of the lack of appetite or depraved tastes. They cannot be induced to eat what they do not fancy, and efforts at compulsion only lead to vomiting. Such children are usually thin, anemic and lack endurance. Disorders of sleep are also common in neurotic children. Habitual sleeplessness, not due to some physical ailment usually means a neurotic child. There are a variety of these sleep disturbances such as wakefulness, various movements or behavior during sleep, such as grinding the teeth, talking, laughing, crying, somnambulism, *favor nocturnum* or night terrors, etc.

While these sleep disturbances are apt to be associated with gastro-intestinal irritation or adenoid growths, they are much more easily excited in neurotic children than in normal children. It should be noted here that day terrors, or *favor diurnum* occasionally occur in neurotic children. We have said that the neurotic child is one in which the emotions are easily aroused, very strongly felt and restrained with unusual difficulty. These emotions may consist of uncontrollable fear, fits of anger sometimes termed "convulsive rage," love of sympathy, selfishness, envy, discontentment with everything, morbid sensitiveness with a tendency to melancholia and nervous exhaustion.

Etiology. This is of very great importance in the study of these cases, because our aim should be in the prevention of them if possible. There can be no doubt that the most of these neurotic children are born of neurotic parents. The heredity tendency may be modified by training, but it will seldom be entirely overcome. I firmly believe, however, that some cases are developed. In a family where several children show no evidence of this disposition, we not rarely find one which after scarlet fever, measles or an acute gastro-enteritis or a chronic intestinal infection may show all the symptoms of neurasthenia.

We are all familiar with the irritable temper and changed disposition of children as well as adults during certain derangements of the digestive organs. This is more evident in subacute and chronic disturbances than in the acute, and if the disturbance is prolonged there seems to be a permanent injury done to the nervous system as a result of the malnutrition and absorption of deleterious substances from the intestinal canal. I have observed cases of very severe gastro-intestinal infection whose digestive function has for years remained abnormal; long enough to seriously affect their nutrition and their nervous stability.

We must therefore reach the conclusion that chronic gastro-intestinal infections may be a factor in developing cases of neurasthenia in children.

Combe in his treatise on Auto-intoxication (p. 151) says: "The intoxicated, particularly in childhood, are all nervous. Their character changes, they are irritable, emotional, moody, quickly angered at nothing, easily transported by a surprise, fear or vexation. They cry without reason and laugh without cause. They are bawlers, nuisances and unbearable. They present in a word all the symptoms of cerebral hyperaesthesia." "We admit with Dubois—for we have seen many cases—that there are many neurasthenics, who present the classical picture of neurasthenia, who, from their own admissions suffer from predominating gastro-intestinal symptoms."

"Besides the nervous forms of neurasthenia, we admit the existence of a much more frequent form, which is without doubt of toxic origin." "The mental symptoms are those of sadness, fatigue, irresolution, depression, multiple phobias and particularly nosophobia."

He describes cases of autotoxic crises of *petit mal* and *grand mal*.

Herter in his recent work on "Infantilism Due to Intestinal Auto-intoxication," says these cases of infantilism "are often irritable, feverish and emotionally depressed and depressing." He cites a case in which he believes an error in diet produced epileptiform seizures coming at short intervals. He says: (p. 80) "I believe this case to be a clearly defined and unimpeachable instance of epilepsy developing as a result of cerebral irritative intoxication from putrefactive products absorbed from the intestine." "This case is thus in my judgment a singularly definite example of epilepsy arising from intestinal intoxication in a child with a nervous system rendered unstable by long intoxication of milder intensity than that needed to induce grand mal seizures."

The above statements as to the influence of intestinal disturbances upon the nervous system agree so exactly with the opinion I have formed from clinical observation that I quote their statements. This etiological factor in the production of neurotic disturbances in children, and the constant augmentation of the large number of these unfortunates, has too long been overlooked and neglected. Time and space will not permit us to dilate upon the other factors in our modern life which tend to develop or aggravate neurotic dispositions. Among these we may merely mention the excitement of modern city life with its noises, the broken sleep, late hours, school pressure, theatres, parties, etc.

Nor should we forget the effects of various peripheral irritations such as adenoid growths, eye strain, phymosis in boys, vaginitis in girls, nasal growths, etc.

Any one of these may aggravate the nervous condition, especially in a child whose nervous system is already unstable.

Another factor in the development of neurasthenia in a neurotic child is the nervous, hysterical or unstable mother. The discipline of a nervous child should be evenly consistent with a firm steadfast policy, not a fitful one. Many of the peculiarities of children are the result of parental influence and teaching. When parents are fitful and inconsistent in government, little in the way of stability can be expected of their children, even when both parents agree on the policy to be followed. It is infinitely worse when they do not agree, and there is resentment kindled by the restraint of the one as opposed to the indulgence of the other. Neurotic children are especially sensitive to any real or fancied injustice or partiality. They feel these most keenly and resent them to the last. They are very susceptible to suggestion, especially when it fits into their whims or emotions. A mere suggestion of fear of lightning, a runaway horse or dark-bugaboo is sufficient to cause intense paroxysms of fear. Many lives are often made cruelly miserable by such suggestion made by unwise mothers or nurses.

Before making the diagnosis of neurasthenia we should be thorough in our examination so as to exclude epilepsy, cerebral tumors, choreas, malarial or intestinal toxemias.

What becomes of the neurasthenic child? This will depend in many cases upon our ability to improve the environment. Some cases will remain permanently the same neurotic specimens until maturity, and will exhibit symptoms of neurasthenia under any unusual strain in after life. Under favorable conditions many or most cases recover sufficient mental balance to be regarded as normal. The treatment of these cases is at best difficult. It will consist in a careful search for cause of nervous irritation and nerve tire. The examination should be thorough for any possible organic disease, especially for peripheral irritations such as phymosis, vaginal irritation, adenoid growths, eye strain, middle ear infection, chronic skin eruptions and lastly but most important chronic gastro-intestinal disturbances. Any one of these which may be present should receive prompt attention. Having excluded these conditions and having determined that we are dealing with a nervous instability, or neurasthenia, we devote our attention to correcting any defect in diet, management or habits, which careful search can suggest.

In our management of these cases we should remember their sensitiveness to their faults, their desire for sympathy and their tendency to impose upon anxious parents. Too much treatment is to be avoided, as they early learn that they are receiving the almost constant concern of their parents and become tyrannical in their demands for more than a reasonable amount of attention. The treatment must, therefore, be largely educational. The most difficult part of this is usually to secure the co-operation of the parents. They have become so accustomed to regarding the child as delicate, nervous and not like other children, that it is difficult to persuade them that a different management is necessary. Even when persuaded they find it almost impossible to change habits once firmly fixed.

Take, for example, the habit of retiring late and sleeping late in the morning, or the practice of allowing a child of six to ten years to attend the theatre once a week. To secure the co-operation on the part of a mother to get her to change these habits is not easy, especially when she herself has formed the same habits.

Such reforms should be advised only after due deliberation on the part of the physician, and then should not be discussed in the presence of the child if it be old enough to understand the advice given. It is usually best to bring about one or two reforms at one time, beginning with the easier ones.

In some cases it is best to turn this part of the management over to a nurse or sensible maid, where this is possible. The recreation, play, exercise and entertainment of such a child should be planned with care and judgment. These should not be too severe, for we must remember that these children cannot endure fatigue without exhaustion. Walking in the open air should be insisted upon to a moderate degree when weather will permit, and as soon as the baby is able to walk with ease, but the walking should not be urged to the point of great fatigue. The practice of teaching these often precocious children to memorize verses for the entertainment of friends should be discouraged. They should be kept from school until six or seven years of age.

Children of this class usually have some abnormality of appetite. Anorexia is the rule, or at least an indisposition to eat substantial food.

They seldom seem hungry and when they do eat their appetite must be coaxed with some food that strikes their fancy. The anxious mother is inclined to offer any kind of food that will be eaten, without regard to its appropriateness. The diet is too often selected by the child, and is based upon its fancy or depraved appetite.

Some of these neurotic children will eat much better at a strange table or even at home when the parents are absent, and no attempt is made to coerce them. The constant anxiety of parents to urge the child to eat what it does not like keeps it on the defensive and impels it to refuse dishes it really wants to eat.

It is usually more successful to avoid any attempt at coercion, but allow only proper food, giving preference among allowable articles to the child's likes and dislikes. Stomachic tonics may be tried but they are liable to prove disappointing.

As a leading symptom in these cases is malnutrition and mental and physical exhaustion, they should have long hours of sleep to rest the nervous system and the body as well. From twelve to sixteen hours rest in bed each day is a necessity up to four or five years of age. Marked cases of neurasthenia with persistent anorexia will often eat better and thrive much better under this rest treatment. Many of them are too active, going from one thing to another until they are exhausted, lie down a short time and then get up and play until again exhausted.

Enforced rest will do much to improve both the appetite and the sleep of many of them.

Hygienic measures and diet are the chief reliance. Judicious out-door exercise, plenty of fresh air at night, the removal of causes of nerve irritation or nerve exhaustion, enforced rest, regulated diet, and general tonics are successful. A careful watch is to be kept upon the digestive organs and the diet. Frequent inspection of the stools and urine should be made when we suspect intoxication. The examination of no case of neurasthenia is complete without an interrogation of these excretions. This is especially true with children. The color, consistency, odor and sediment after washing the stools will afford valuable diagnostic information, as to the completeness of digestion and the presence or absence of abnormal fermentations. It is often of much help to examine stained smears, and comparison of these with smears of normal feces.

The urine examination should include at least a qualitative test for albumin, sugar, indoxyl and skatoxyl.

A test has been devised by Amann, which bids fair to be valuable. It consists in measuring and comparing the number of drops which a given volume of the urine will deliver from a capillary outlet, to the number of drops which the same volume of water will deliver. A given volume of urine will form more drops than the same volume of water; usually about ten drops to the 100. The urine of auto-intoxication will form more drops than normal urine, and the number of drops increases with the intensity of the intoxication.

If the reliability of this method is proven by further observation it will be a very valuable aid in the diagnosis of these often obscure cases of intestinal auto-intoxication.

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I have emphasized the importance of the diagnosis of autointoxication because of its importance as a cause of many of these irritable and exhausted nervous systems, and because the proper dietetic treatment depends upon the diagnosis, and because the accurate diagnosis is difficult. Time will not permit us to state more than the general principles of the dietetics of these cases.

In the first place we must strive to increase nutrition. This may be done by increasing the nutritives eaten or increase those absorbed and assimilated. This is equivalent to saying that we must strive to increase appetite and digestion.

We have above dilated upon rest and other hygienic measures assisted by tonics, to increase appetite.

To increase both appetite and digestion we must diminish the gastro-intestinal fermentation, and especially intestinal putrefaction by:

1. An antiputrefactive lacto-farinaceous diet.
2. Change the character of the intestinal culture medium, by an entire change of diet.
3. Diminishing the vitality of the proteolytic bacteria by germicidal medicines.
4. Removing as far as possible the bacteria and their toxins from the bowel by lavage or evacuants.

It has been shown that when a child lives on milk alone, it can maintain normal nitrogen growth on the proteids of one and a half ounces of cow's milk for each pound of body weight per day. A child of 30 lbs. weight will receive enough proteid in 45 ounces of milk without any meat foods. The practical inhibition of putrefactive bacterial growth can best be accomplished by changing the intestinal culture medium. This can be done by an entire change in diet, by giving as little putrefactive articles and as much antiputrefactive ones as possible.

1. A meat diet is putrefactive. White of eggs is also so, but much less than meat.
2. Fats of meats are found by experiment to increase the indol in the urine and hence intestinal putrefaction. Butter and cream are much less active in this respect than meat fats. Excessive amounts of fat or rich cream are not well borne.

3. Milk and farinaceous foods—cereal flours and their derivatives, rice, sago and tapioca—are our chief antiputrefactive foods. Excess of sugar is to be avoided.

Milk is to be forbidden in all cases of acute enteritis, but given in subacute and chronic intoxications. Raw milk, when pure and clean, is preferable to cooked milk. Whey may be allowed in most cases of even acute enteritis unless very severe.

It is best to give farinaceous foods freely with the milk in all children over nine months of age, but especially is this true in those, the subjects of intestinal putrefaction. Farinaceous foods must be thoroughly cooked and for a long time.

Gelatin is a form of protein which is generally tolerated in intestinal putrefaction without harm. A soup may be made with gelatin as the basis, instead of meat infusions, and which I have used with satisfaction.

Of the gastric antiseptics sometimes useful, we will mention hydrochloric acid, menthol, creosote carbonate, ichthyol and thioform, without dilating upon the indications for their use.

Of the intestinal antiseptics we must give first place to calomel given in small, oft repeated doses. Creosote dissolved in cod liver oil (1%), ichthyol, and the salicylic esters, especially salacetol, are of some service.

In this somewhat unsatisfactory brief mention, I have suggested the lines of treatment that I believe will be found most successful in dealing with those cases of neurotic children, in which gastro-intestinal disturbances are a prominent feature. Unless this feature of these cases is recognized and relieved all other treatment will be unsatisfactory.

At best the management of such cases as I have tried to picture in this paper is tedious and difficult.

If I have laid too much stress upon the intestinal origin and complication of the cases, it has been done in the hope that it may lead others to recognize this fact early, and thus prevent the development of neurasthenic children, and prevent much avoidable suffering and numerous accessions to the already too numerous army of neurotic men and women.

THE MENTALLY DEFICIENT CHILD IN SCHOOL, A VICTIM OF EDUCATIONAL METHODS AND INCOMPETENT BOARDS.*

By H. Brooker Mills, M. D.,

Philadelphia, Pa.

Lecturer on Pediatrics at the Medico-Chirurgical College, Assistant Pediatrist to the Medico-Chirurgical Hospital, Philadelphia.

The duty of the physician to all his patients, but, particularly, to the child, is paramount. He must be well aware of the essential knowledge whereby he can guide ignorant parents, and he must continue to direct the child throughout the formative years or the plastic period. He must know the practical points involved, of which heredity, environment, impressions, surroundings and education are the most important. The observations made in the home are all important ones, and that is the reason the old colored mammy of the South used to be so successful in the raising of children. The welfare of the State depends upon the homes, i. e., upon parenthood, and upon the mother falls the principal responsibility, next to which comes that of the physician. The child should not be regarded as an immature adult, but as a human being in the process of developmental evolution, and, in this connection, heredity, education and environment are the important points involved. The examination of the child should be as much psychical as physical and the information thus obtained cannot but cause us to condemn the crowding of glittering generalities at the expense of dogma and recreation by our present educational methods.

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* Read at the annual meeting of the Association of American Teachers of the Diseases of Children, Atlantic City, June 7, 1909.

There is a large class of children that are not utterly defective and yet are not normal. More physical and moral and less intellectual instruction is what is needed, especially for such children. Children are taught too many things, which, as Mark Twain said, "ain't so." We must keep our mental as well as our physical eyes open in dealing with children. To quote Dr. J. Madison Taylor, "the physiology of childhood is not yet written, and the data for the writing is yet to be gathered." Doing is better than knowing. The imagination is a constructive faculty. When observations were recently made in New York as to the number of school children who went to school without breakfast, the number was found to be very large, but it was also found that in many cases the reason was not the absence of food for breakfast, but the absence of an appetite for the food, due to improper ventilation and overcrowding of the bedroom during sleep. Many cases of supposed pneumonia and typhoid in children are sent to hospitals when the real disease is neglect and the only treatment required is care. Children have three ages, actual, psychical and physiological and the physician should recognize them all.

Much good would be accomplished for the child were it possible for the physician to have the say in the selection of life partners. Could he but stop consanguineous marriages, marriages of tuberculous and syphilitic individuals, marriages of criminals and persons mentally defective, much would be accomplished, and, failing in this, could he but exercise his medical knowledge and surgical ability to prevent pregnancy following such marriages, great good would be done to the State, and even though the prevention of such marriages and the resulting pregnancies be rarely possible, it is still his duty to use all moral control at his command to accomplish the object. Taking it for granted, however, that the child is here, the physician should familiarize himself as far as possible with that child's heredity before taking up the next all important question, environment. As to the heredity, but little can be done to overcome its evil effects except in the way of prophylaxis which must be accomplished by environment, education and training.

The very rich will not and the very poor cannot give the child its birthright, i. e., breast milk, the former because they will not and the latter because they cannot take the time, it so often being necessary for the mother to be the breadwinner as well. It is therefore with the great middle class that most of our work falls and the most good can be done, but it is the physician's duty to know no class, and he should insist in every way possible that the child be given breast milk, except there be medical or physical contra-indications. Next to feeding comes the bathing and the clothing. Here again we find a class division; the very rich overclothe from ignorance and the very poor underclothe from necessity, while the great middle class is probably about equally divided, probably due to ignorance and indifference. The physician may accomplish much by insisting upon light, airy clothing in the summer time and not too heavy in the winter. As to bathing, far too little water is used by all classes. Many a baby's cry—which is supposed to be due to pain or to hunger or to temper—is nothing but the cry of the system for water. Water internally and water externally should be as much a part of the baby's daily diet as its food, if not more so. Dr. W. C. Hollopeter states that "many a child has fallen to sleep after a little sip of water from its bottle, and many a choreic child will quiet down and rest for hours following a long, warm, tub bath." As to fresh air, much may be said, particularly in view of our enlightenment during the past few years on the question of fresh air in the treatment of disease. We know that there are practically no contra-indications to the use of fresh air in sickness or in health, and it is the physician's duty to demand for his little patients all it is possible for them to obtain.

EDUCATIONAL METHODS ARE BAD.

Perhaps one of our most important duties, in addition to those mentioned, is the supervising of the child's education and along this line of late much has been written. The statement is frequently made that the home for feeble minded children, the prisons and the insane asylums are receiving more than their proper quota in proportion to the population on account, it is claimed, of the present educational methods and with this view I heartily concur. Unfortunately, but little can be accomplished by the physician under our present system, and yet his duty is perhaps the greatest during the school period of life, were his views considered of any value.

Three years' experience on a local school board in Philadelphia, together with in-patient and out-patient experience in several large hospitals, extending over a period of thirteen years, leads me to say without hesitation that a large number of children are mentally and physically victims of our present school system, the result of which will become more prominent as the years go by. What can a physician do to change the fact that nearly 40% of the children in the second year at one of our public schools in Philadelphia have been in that grade for two years, and that the average age of the child is over nine years when the law requires them to enter the first year at the age of six? What physician would approve of four hour examinations for children in their second year of school, yet such is required? Girls are compelled to devote a certain amount of time to the learning of cooking and sewing, both very necessary subjects, and yet must keep up with the boys of the class in addition. Is it not our duty to interfere in the interest of the child who cannot keep up with his class, and yet is not only denied the privilege of being put into a lower, but is advanced to a higher class because of his size? Is there not opportunity for much work on our part in the interest of the mentally deficient child whose name is taken off the roll in the spring because, owing to his sure failure, he would bring down the class percentage if examined and is then readmitted to the same class in the fall, is examined and fails to pass the next year, and finally reaching the legal age is taken out of school altogether to go to work, he at that time being scarcely able to write his name? Should we not exercise our rights as physicians in the interest of the mentally deficient children and prevent them being kept in one grade three years when they are not mentally competent to be in a public school at all? Our duty is not only to such children but to all other children with whom they are brought in contact during these years in school. In this connection the harm to the other pupils is extremely magnified by the system of placing the mentally dull child in different classes of the same grade each year with the hope of trying each teacher's ability, the results being that these three classes of forty-five or fifty children each are thrown for a year in contact with this child to their detriment without being to his advantage.

School Year Too Long.

One of the great drawbacks to our present school system is the length of the school year, the children having practically ten months of almost continuous school work leaving but two months of each year for their little minds to get rest and their little bodies to get sufficient of the proper kind of physical training.

I cannot too strongly condemn the night work that these little ones have to do. Not only are the school hours filled sufficiently full of hard work for the child to tire out its mentality before evening, but in addition the night work deprives it of the opportunity to get the abundance of fresh air and rest and recreation which its body so badly needs. Another objection to the night work is that so few parents are able to be of any assistance to the child in doing its work, owing partly to the fact that many parents are utterly incompetent to assist their children, and partly to the fact that, never mind how competent a parent may be to assist the child, the method of doing so is not that which the child is being taught and therefore not the one the teacher will accept. The way children are taught to write and work out mathematical problems today is so entirely different from that taught their parents that I know of many instances where a parent would work an answer agreeing entirely with the child, but owing to the method being different, the process of working it out would not be accepted by the teacher. Night work therefore not only for the child's sake but also for the parent's should be absolutely condemned.

I wish it distinctly understood that when I speak of mentally deficient children I refer only to children who are mentally deficient after everything possible in a medical and surgical way has been done to relieve their physical defects, realizing as I do that the mental dulness of many children is but the result of physical defects, among the most prominent being adenoids, enlarged tonsils, impaired hearing and imperfect vision, all of which need to be promptly corrected before the child's mentality may be properly gauged.

Of course, the remedy for this lies in the formation of more special schools although one of the officials of our present Board of Education does not believe in a special school but would rather promote the dull child after two or three years in a class if in the meantime he has grown to a size out of proportion to the remainder of the class. We as physicians should band ourselves together in the interest of the little children especially those who are mentally deficient and demand for them at least equal rights with others if not advanced rights, such as would be secured by the formation of special schools and the proper discrimination of the students. In my opinion every local board should have at least one-third of its twelve members medical men whose duty it should be to look after the physical, moral, mental and intellectual welfare of the children in his district, and whose recommendations along these lines should always receive the hearty support of the entire educational board. How can a few laymen decide as to a child's mentality and the proper place to train it? As to District Superintendents who owe their position to political influence and issue such orders as I have mentioned above, what training have they had to fit them to discriminate between the normal and the abnormal child, physically or mentally? No difficulty would be experienced in getting physicians in all parts of our cities to pass upon the mental calibre of a child referred to him by a school Principal, were it likely that his opinion would be given any weight by the select few who now pose as educators and ignore the cry of the mentally unfortunate child, and the plea of the parent, and view the family physician as a know-nothing. This is a duty we owe the child, the community and the country at large, and while our present system of medical inspection of schools is a step in the right direction, it not only does not go far enough, but the recommendations of the medical inspectors are too often ignored.

particularly those concerning mentality. With the present large number of free dispensaries in all cities it is possible for the physical recommendations to receive prompt attention. It behooves us as physicians to exercise this, the greatest of all duties to the fullest extent. An act was recently before the Pennsylvania Legislature to provide an institution for inebriates, and necessary though that be, and worthy as the object is, I feel if we start with the child and its proper supervision from a hereditary point of view, the correction of the physical defects followed by early mental training and the proper educational surroundings, it will yearly lessen the need for such institutions and will yearly diminish the number of young adults now to be found in our insane asylums, as many of the vicious habits, evil tendencies and moral weaknesses would be checked in their very beginning.

WHAT THE CHILD SHOULD HAVE.

Could the laity but realize as we as physicians do what it means to a child, as a child, and to his or her future as a citizen, to have good, healthy, moral and physical surroundings, a good education and as perfect a physical body as medicine and surgery can make it, and as well developed a brain as our present knowledge enables us to give, and could they but know as we do of some of the results where the foregoing has been followed, there would be little if any trouble in securing the hearty co-operation of every father and mother in the country to further the objects of this paper. I am sure that every physician who has any experience in the handling of little children could recall many cases of various kinds of nervous affections which have been improved even if not cured by securing proper hygienic and dietetic control, a favorable home life, the right kind of a school, correction of its educational methods and of any physical defects from which it might be suffering. Take a child away from over-indulgent parents, and place it where its diet may be controlled, its surroundings and education be properly supervised, its natural or acquired bad habits corrected, and notice what a different child you will have in a year's time. It is manifestly unfair to seat a mentally deficient child, a tuberculous child, or one who is the victim of any of the nervous diseases of childhood, in a class room with forty or fifty others, and not only expect it to keep up with the others but to expect the others not to be affected by its presence.

As to medicine for children, I have nothing to say for I believe the observance of the foregoing suggestions will enable us to develop the great majority of our little children into healthful and creditable citizens with a minimum of medication.

Recommendations.

(1) The reduction of the school year from ten months to nine.

(2) The reduction of the hours of the school day from five to two sessions of two hours each, with two hours intermission.

(3) The discontinuance of all home work.

(4) The physical examination of every child at the opening of the school term in the Fall and regularly every three months thereafter for the detection of adenoids, enlarged tonsils, impaired vision and hearing, etc.

(5) The instructing of teachers to make careful note of the mentally backward child, and to report the same to the Principal weekly for one month, at the end of which time, if there be no improvement, the referring of the child for medical examination as to its physical and mental condition.

(6) The establishment of special schools, or special classes in different parts of existing schools, for the mentally backward children, each child to be graded according to its mental capacity, regardless of size and age.

(7) Separate class rooms for the boys and girls.

(8) Separate schools or at least separate class rooms in the different parts of existing schools for members of the colored race.

(9) Careful inspection of the home life and surroundings of a mentally deficient child, especially as to heredity, and the character and calibre of the parents.

(10) The report of the school physician or of the family physician to be taken individually or collectively as final, so that a child's mentality may not be passed upon by incompetent laymen.

(11) Male teachers for boys and female teachers for the girls, with preferably a male supervising Principal in all mixed schools.

(12) All difference of opinion occurring between the family physician and the school physician as to the child's mentality and grading, should be settled by reference to a third physician, to be mutually agreed upon by these two.

(13) The conducting of classes in the open air as far as possible in all suitable weather in the many cases throughout the year.

(14) The frequent reporting to the parents by the teacher of the standing of a backward child.

SHOULD THE PRINCIPLES OF NUTRITION BE TAUGHT IN OUR SCHOOLS?*

By CHARLES DOUGLAS, M. D.,

Professor of Diseases of Children, Detroit College of Medicine, Detroit, Mich.

Nutrition, considered in the broadest sense, is the most important subject in pediatrical work. It is directly concerned with the building up of the child in the first place and with the preservation of its health, strength and appearance afterwards. Its relation to prophylaxis is so great that it covers a wider field than any other subject bearing on the life and health of the child, and the future size, shape and health of the adult.

The application of nutritional knowledge, commences with the birth of the infant and continues through its entire growth. It also applies to the preservation of health, by giving such knowledge when properly applied, as will prevent most of the sickness during the first year, and a very large proportion of the diseases during youth and adult life afterwards. Such being the case, it is necessary that humanity should know as much as possible about this subject. It is much more important to know how to build up a body of full size and well proportioned in all details, than it is to spend our time and skill in trying to repair the damage caused by a lack of that building knowledge. This subject is very far reaching in its application.

First—It commences with the nursing era.

Second—Continues through school life; and accompanies the adult through all his occupations.

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* President's address delivered before the Association of American Teachers of the Diseases of Children, Atlantic City, June 7, 1909.

To see clearly its value, let us look at the present practices followed in these different ages, their errors and how to avoid them.

First—The nursing era. Here we generally meet the ignorance of the young mother, her relatives, her friends and the untrained nurse, together with, too often, the indifference if not ignorance of the attending physician. The ignorance of the relatives, friends and untrained nurses cannot be rectified or changed, consequently their absurd recommendations of different foods, particularly the quantities thereof for mother and child, must be set aside, and our efforts directed to educating the young mother above this ignorance which surrounds her and is so generally injurious to the infant's health and growth, and life also, in many cases. She must be taught the effect which different articles in her own dietary have upon her milk, and consequently upon her infant. The injurious and colicky effect of nearly all fruits, must be clearly pointed out, particularly of all very acid varieties. She must be shown that the same results follow the use of most medicines, particularly cathartics, which pass to the infant through her milk, thus irritating its digestive tract, disturbing its sleep and reducing its nutrition.

The young mother should know that there are three different foods in her milk; their uses in the body; the daily evidences of their correct digestion and consequent successful nutrition as well as proofs of errors therein shown by colicky pains, broken sleep, unhealthy stools and failure to grow steadily and regularly; that there is no successful baby except the happy one; and that colic in the infant is evidence of an error and not a necessary accompaniment of infantile life. And what shall we say of the attending physician? Unfortunately he is too often the victim of usage in his relation to mother and child. Too frequently he divides his attention between them in proportion to their respective weights—to the mother of 130 pounds, he gives twenty times more attention than to the infant of six or seven pounds. This is wrong. The mother requires all she gets now—the infant generally requires more than it receives. It is his duty to impress on the mother that her infant's growth and future health depend upon her ability to supply it at all times with that proportion of fat, proteid, and carbohydrate in its diet suited to its digestive power. As during the nursing period these are supplied by her milk, she should be taught to look for an explanation of most sicknesses in the infant's stools; that too much mucus there follows her own overeating of meat, eggs and milk, mental worry, extraordinary labor, most medicines, particularly cathartics, irregular nursing, and nursing too many minutes in each day or too many months in all, and that watery stools are due to too much sugar, fruits or starches. She should be taught the necessity of avoiding some foods altogether, and excesses in other ones. She should be shown that there is no possibility of training the infant to consume milk from unsuitable food, by commencing to nurse in that way, and that only such foods and exercises can be indulged in, as secure comfort and abundance of sleep for both mother and child at all times. Particularly strong should be the injunction, that the infant does not thrive because it has many stools daily, with much colic and gassy discharges. She should be taught to always give the infant the same privileges and results in food and clothing she finds necessary for her own comfort in day time, and full amount of sleep at night.

When a mother cannot nurse her infant and consequently is compelled to substitute other foods for her own milk, she should know that the perfect nutrition and growth of the infant depend upon securing healthy stools of one uniform shade at all times, and it should be clearly impressed upon her that this result depends as much upon the amount and method of feeding as upon the quality of food used.

Second—Nutrition and school life.

As soon as the child is old enough to be trusted on the streets alone, it is considered by most parents old enough to send to school. Now the mother has, in many cases, to provide for a new situation if the noon day meal has to be eaten in the school. If this is carried by the child, a properly educated mother can and will see that it contains a fair proportion of fat, proteid and carbohydrates; but an uneducated mother will supply a meal containing carbohydrates, mostly bread, cakes and fruit. This is wrong both from a nutritional and educational point of view—nutritional as it does not supply all the foods needed at that meal—educational as it teaches the child to use a one sided dietary.

As children grow older and reach the last year or two of school life, strong contrasts are seen in their growth and development. Some are large, robust, ruddy and vigorous, anxious and ready for all exercise and rough games that the situation provides. They have been well nourished, have received and used a fair and suitable proportion of fat, proteid and carbohydrate in their daily dietary with an abundance of fresh air, sunlight and daily exercise. Other children are there who are pale, anemic and frail in appearance, low in weight and short in energy; sufferers from headaches, indigestion and unnatural appetites, satisfied to sit in the shade and watch while their comrades romp and play. Why are they thus? They are the results of imperfect nutrition which has very frequently commenced during the first few weeks of infantile life, and been perpetuated by parental ignorance and indulgence more or less through all subsequent weeks and years up to the present age. These latter children are a very strong commentary on an educational system which produces parents who will raise their children in such manner and way as to give these delicate results.

During the last year or an earlier one of school life, enough of the principles of human nutrition should be taught in our higher grade schools, and in all our colleges, nature's plan of building, maintaining and repairing the human body, particularly the bad results, immediate and remote, which follow infractions of her laws, should be shown clearly and systematically as a necessary if not most important part of their whole education. All other subjects taught, have as an ultimate object, the proper care and development of the pupils, mentally. Why should there be any hesitation or omission in giving them that physical knowledge of themselves always needed to enable them to properly and successfully use those other educational subjects crowded into them during their school or college life?

At present, nutrition is taught only inferentially, as the pupil can apply it from a botanical or other study. This is too distant to give it that importance and value belonging to such a vital subject, and does not bring out clearly the early sickness and remote damages following errors in dietary and consequent nutrition. In all schools and colleges, which teach female pupils, particularly the older ones, the correct physiological use of fats, proteids and carbohydrates with the daily proofs thereof should be clearly taught. The natural results following their proper use, beauty, good health, rapid growth, full size, freedom from pains and aches, and perfection of form—should be clearly pointed out and in such a manner as to permanently impress upon them the importance of a correctly balanced dietary at all ages. In contrast with these good results, they should be taught and made to realize, the injurious results following improper use of foods; that all foods which are not properly and comfortably digested, decompose in the body, thus making poisonous and irritating products that cause sickness.

That in infants this causes long continued digestive disturbances and consequently prevents growth.

In youths, it explains the frail bodies, pale countenances, frequent complaints and sickness, and often unbalanced mental conditions. In adults, it tends to irritability, sour disposition, sallow countenance, weakness and many diseases. The dwarfs, the ill-shaped people which we see on our streets, and the smaller members of our families, can usually trace their variations in size and shape to a period in life when their nutrition was imperfect.

As the evidences of error, which lead to imperfect nutrition, are quickly and easily recognized, and when early recognized, easily corrected, the question arises, "why do we see the bad results so frequently?" Physicians know that it is always due to a lack of knowledge on the part of the parents, particularly of the mother, and the ignorant advice and suggestion of other parents and friends, equally misinformed, thus leading their ideas on infantile and adult dietary in the wrong direction, and often to the injury of themselves and their children.

The experience of physicians, particularly of those who treat only "the diseases of children, shows that this ignorance is the foundation of three-fourths of the sickness during the first two years of infantile life, and a large proportion of the diseases occurring in later years. After the damage, often irreparable, is done, or a severe sickness is established, the physician is called on for assistance and guidance. He is thus called on to repair these bad results, often when it is too late, instead of being asked early for guidance and direction in the proper building and rearing of strong, healthy children. His examination always shows that young parents have not been taught any of the truths or errors regarding their own nutrition, the proper and improper use of foods, and the immediate as well as remote results, following each; the correct clothing or protection of the body in different seasons and climates; the immense value of fresh air and sunshine; the necessity for regular exercise to develop and beautify all the outward parts of the body and secure healthy, vigorous work in all the internal organs.

These subjects have been largely omitted in their school or college curriculum, or taught in such a distant, inferential or imperfect way, that the pupils have not received enough knowledge to make them independent thinkers on these subjects of such vital and daily importance to them and their families. The continual complaint and excuse of young mothers, is that they know nothing about these subjects; that they did as their mothers, grandmothers or some friend, equally ignorant, had advised.

How is this condition of our civilization to be corrected? Only by education at such time and in such way, as protects the susceptible anxious mind from making mistakes, by implanting such correct information on all these subjects during the educational course as will enable future parents to recognize an error immediately, and secure its correction before irreparable damages occur.

There is no school or educational source between our present school systems and the future duties of life. We compel our children to study other subjects which have no bearing upon their present or future health, and the avoidance of disease at all ages. True it is that the construction of the body and of the different organs therein, is a part of the present educational course, but the function of each organ and the proper use of it each day, those subjects which concern the present as well as the future health, are omitted entirely or so imperfectly taught, as to leave the pupils after school life is ended, the victims of inherited health ideas which too often are founded on error and confusion of thought. The result is that physicians are continually called in even by the presumedly best educated people, to correct errors in nutrition which could only arise from the densest ignorance.

Our educational system should teach, above all other subjects, the function of each organ in the body; the part it plays in the construction and maintenance of the individual; how to use each organ correctly; the immediate evidences of such correct use; and the present as well as the remote results which follow the abuse of each and every secreting as well as excreting part of the individual.

At present, a feeble effort is made in some schools to give part of this knowledge, but the results seen by physicians daily, show that it falls short of giving enough knowledge to make even the graduates from our educational institutions, logical or independent thinkers on all subjects concerning the proper use of foods, preservation of health, and the avoidance of diseases in themselves or their children.

During the last few years, the teaching of Domestic Science has very largely increased the amount of practical, usable knowledge imparted to pupils, thus showing the valuable trend of present education which should be encouraged as it imparts a knowledge of subjects necessary for daily use in every family. This kind of education should be enlarged, and, if necessary, some of the higher grades in mathematics and languages reduced to make room for it in the present college curriculum.

When this has been accomplished, as it ultimately will be, we will see the young ladies leaving our educational institutions, a strong contrast mentally, with what they are now. In addition to that unusable knowledge which parents are at present so anxious for their daughters to obtain, but which they have themselves mostly forgotten, if they ever learned it, they will find their daughters fully equipped with usable every day information, concerning all those subjects which enter into the growth and maintenance of strong, healthy humanity at all ages. On this broad foundation of physical knowledge and the resultant health and strength, they can appreciate the labors and efforts of their parents who had fewer advantages. They can direct their own thoughts and studies in physiological lines productive of good results; they can be imparters of correct knowledge on all subjects of foods and health instead of being receivers of false and confusing teaching as at present. They will at once be absolute mistresses of all health details in their own households and when blessed with children, will from the hour of their birth, be able to detect errors in their diet, clothing, and exercise, thus avoiding most of the sicknesses in infancy and many of the ailments of youth and adult age.

Mothers, thus educated, will intelligently strive to lessen all inherited weaknesses in their children; will always preserve their natural healthy digestive power by preventing all those excesses in each food which now send over eighty thousand infants each year to their graves, and also damage or cripple an equal or greater number more.

THE ASSOCIATION OF AMERICAN TEACHERS OF DISEASES OF CHILDREN.

ANNUAL MEETING, ATLANTIC CITY, JUNE 7TH, 1909.

DR. CHARLES DOUGLAS, PRESIDENT, IN THE CHAIR.

DISCUSSION OF DR. KERR'S PAPER.

Dr. Alfred C. Cotton, Rush Medical College, Chicago, Ill., said that they had with them a man they all knew well, one whose knowledge of pediatric subjects seemed to most of them encyclopedic, and he knew that he expressed the wish of all present when he asked Dr. Jacobi of New York to give them some idea as to how he classified his bulk of knowledge and kept so well read for so many years.

Dr. A. Jacobi, Emeritus Professor of Pediatrics, College of Physicians and Surgeons, New York, said that personally he had no fault to find with Dr. Cotton, but that Dr. Cotton's judgment was at fault, for he did not have such an abundance of knowledge as Dr. Cotton intimated. However he was old enough to have seen many books and journals, but he had not had as much time as he should have wished to read all of them. It was true that there were a number of text-books, for instance, which, according to the advice given by Dr. Kerr, he had been careful to avoid reading; they made up quite a considerable number.

So far as the paper to be discussed was concerned, Dr. Jacobi did not believe it could be discussed; if they talked at all it would not be to discuss the paper but to give approval. Dr. Kerr was a man who had studied with a philosophic mind. The paper was one that would be read and re-read and would give all the information necessary and useful to the philosophical physician.

DISCUSSION ON DR. WYNKOOP'S PAPER.

Dr. Alfred C. Cotton, Rush Medical College, Chicago, Ill., said that it seemed to him the keynote of the relations, personal, of teacher and student was contained in the paper, and it was the purpose of their association to increase the facilities through which the personal relations between them could be increased. He believed that there was a tendency at the present day to have teaching facilities that would bring the students in touch with the material in smaller classes. In this way the teacher could study the needs of the student individually. In many institutions the course has been extended over four quarters, with the faculties doubled and quadrupled, or more in number, this made it possible for each instructor to have a class of six or twelve students under his supervision two or three times a week. In some institutions the teacher becomes personally acquainted with each student. The students are required to write up a case, giving the history, the diagnosis, the pathology and perhaps the etiology, and they were graded according to these reports. Where the staff of teachers was large enough, the students were necessarily in close touch with the head of the staff and, in this way they became informed of the individual requirements of the different undergraduates.

In a western school a few years ago the Dean sent out a notice or request to the alumni resident near by, or within reaching distance of the college, asking them if they had any interesting case to send the name to the Dean of the college and to state their willingness to take students with them to visit that particular case. There were quite a number of responses. When the physician had an interesting case he at once telephoned to the college and the students were notified, and one or more would repair to the place selected by the outside physician, riding or walking to see the case. Sometimes those cases were reported either to the teacher or some other member of the staff. So far as they were able to observe this was of great benefit to the students. It led to freer discussions. Dr. Cotton was a believer in quizzing in small classes, in conversations between the teachers and the students, in having the instructors know the individual students, to have them visit at the homes of members of the staff or the homes of friends who were willing to cooperate with the staff; this partly filled in the wants expressed by the previous essayist of the departing preceptor or physician of the older times.

Dr. H. M. McClanahan, Professor of Pediatrics, University of Nebraska, Omaha, said that two years ago he invited the senior class to his house. Two years after he met one of these students who told him that, prior to the invitation, the place was like an empty and barren land but after the invitation it had become like an oasis. It had been of great benefit to him.

He said he knew of two men who were quacks. He had asked them why they practised quackery, and one man replied that he had to make a living. Both these men reflected upon their alma mater.

With regard to the relation between the teacher and the student, something larger and broader was the capacity of the teacher of medicine to reach out and influence others along ethical lines in the ways suggested in the paper. A number of those who taught, aside from being physicians, influenced others in a larger and broader sense until in a way each was his brother's keeper.

Dr. A. Jacobi thought he might be able to teach by recalling some reminiscences. He said he had had one or two opportunities of being in close contact with students in his life. The first was when he was Professor of infantile pathology and therapeutics in New York Medical College. There might be some one present who knew enough of the history of medical colleges that such a college did once exist. They closed the doors of this institution in 1864 because the students mostly came from the south, and some of those present, he said, might remember that there was some unpleasantness which prevented the southern students coming to New York at that time. The college was established in 1850 by Dr. Horace Greene, the great laryngologist. Dr. Jacobi became connected with this college in 1860. Since then he had been teaching regularly. They were fortunate enough in that school to have some intelligent members of the faculty; they knew at that time that the only way to teach students was at the bedside. A clinical school was then established in East Thirteenth Street. They had from twenty-six to twenty-eight beds and several children as patients. Some taught the diseases of children, and some taught the diseases of adults. The college was a small one. The students were not many. Therefore, Dr. Jacobi knew every student, and talked with every one of them in person. The students were brought to the bedside to learn. Besides this, they had dispensary instruction. This was one experience he had. There were many excellent practitioners that came from that school.

In 1870 Dr. Jacobi became connected with the College of Physicians and Surgeons and had taught there ever since. The outdoor department furnished him with plenty of material for amphitheatre teaching purposes. Since the number of students in this college was large, one came less in personal contact with them.

In 1908 another opportunity was offered him to get into close contact with the students. An assistant of his who had been associated with him for nearly thirty years told him one day that he had money to spare. He had made through his connection with me and through me with the school and the facilities it gave him fifty thousand dollars ($50,000). He wanted to give that amount to the Columbia University for the purpose of inducing them to establish a service for instruction of the College of Physicians and Surgeons students in some nearby hospital. That was done; such a service was established, although it was small. They started with twelve beds, but afterwards they had sixteen beds for babies. They had, however, the facilities for taking to the bedside in these wards as many students as they wished. The classes contained from twelve to fifteen students, and they were taken there several times a week. Dr. Francis Huber was the man who did this. In this way Dr. Jacobi became intimately acquainted with the students. From that time, since 1898, many men had gone from the college better educated and better acquainted with clinical and practical pediatrics than they had been formerly.

That was another opportunity Dr. Jacobi had of coming into such close contact with individual students. His successor in the school, Dr. L. E. Holt, had continued to teach at the bedside as his Babies' Hospital permitted.

Some members of the medical school had no hospital; a number of them had hospitals, but they were only guests there; without authority to teach at the bedside. There were only a few large schools with such facilities, as for instance, in Philadelphia and perhaps Chicago. Today even Johns Hopkins had no children's hospital, although they were just building one for Dr. v. Pirquet, who had been called from Vienna.

Now there were too many students. If there were one or two hundred students to teach, you could not get in close contact with them. That he knew to be the case at the college of Physicians and Surgeons, and had always been so. Dr. Jacobi said he seldom knew his students. He made his business to call them down into the amphitheatre in order to get in close contact with them. He made them take the histories, make the diagnosis, etc., etc. He thought they had too many students and perhaps too many schools. He had always objected to a large number of students in medicine. If there were less schools, then the attendance at these schools would be larger, but also their means to inherit should be larger than a country college is able to furnish. The larger the school, the larger should also be the teaching staff. One could not do very much when he had to deal with fifty, one hundred or two hundred students.

Dr. Jacobi believed that each teacher should have at least one ward in a hospital at his disposal for teaching purposes. Even if there were but fifty (50) beds much could be done. Classes could be taken to the bedside; they should not number more than ten or twelve if one expected them to see anything to learn. The same material could be utilized for different classes, and without any injury to the patients. In this way, they might be able to accomplish something.

Dr. William C. Hollopeter, Medico-Chirug. College, Philadelphia, said that in Philadelphia we have a method for familiarizing ourselves with the students thus bringing the students in closer contact with the teachers. The student body is encouraged to form societies, each society numbering twenty-five (25) or thirty (30). They are provided with a club room, and meet once a month. One evening, for instance, was assigned to a discussion on diseases of the respiratory tract, and three or four of the senior students took part in the discussion of the subject so assigned. The teacher would be present and thus was given an opportunity of coming in personal contact with each and every one of the members of that society. He will average six meetings during the scholastic year. This, in addition to the ward class work and their weekly clinics, gave them a very good opportunity of knowing the personality of the student. They also held an informal monthly meeting in the club house which gave them another opportunity of coming still more into closer touch with their students. Dr. Hollopeter did not know how far this method had extended in other cities; he would like to know if this method was pursued in other colleges and whether it was working out as satisfactorily and gave as much impetus to the students as it did in Philadelphia. When a group of students were assigned a topic for discussion by the teacher in an informal way, more was to be gained than in the formal way of conducting clinics.

Dr. I. L. Polozker, Lecturer on Pediatrics, Detroit College of Medicine, said that an important thing in this connection had not been mentioned, assigning students to outdoor cases and making them responsible. They complain so much that they consume so much time in reading up the lecture work in the college, that they have not much time for clinical work. If they work in the college from 9 A. M. until 6 P. M. it seemed impossible for them to go out to look at a case. They should awaken to the fact that clinical work was worth more to them than the lectures. Members of the faculties are awakening to this fact. They should have control of their wards as Dr. Jacobi had suggested. Sending out students to the homes of patients requires much time, and clinical work is more important than didactic.

Dr. Godfrey R. Pisek, New York City, Professor of Pediatrics, Medical College, University of Vermont, said that in small colleges the students came in closer contact with the professors than they did in the larger colleges. In a recent communication he had recommended to one of the colleges that the students, as they matriculated, should be so divided into groups of three or four and assigned to one of the faculty for a certain time during their course of training. Thus the member of the faculty would for a certain period of time have charge of these students and give them personal instruction and so come in direct personal contact with them. Then again the student might go with him to outside cases. During a college year the student could come in contact with all the professors and perhaps find his bearings. A little judicious praise here and there toward certain work of the student might result in future credit not only to himself but to the profession as well.

DISCUSSION ON DR. BARTLEY'S PAPER.

Dr. J. Finley Bell, Visiting Physician, Englewood Hospital, Englewood, N. J., said he would like to refer to the advisability of examining the urine for a body described by Dr. Herter one or two years ago, known as Indol-Acetic. The test for this substance was very simple, and consisted in mixing equal quantities of chemically pure hydrochloric acid and urine in a test tube; if this body were present the urine became stained a lilac color, overlaying with amyl alcohol or ether would give an intensified ring at the junction, gradually involving the alcohol. Dr. Bell said he had added this to his routine urinary tests, and he found the reaction positive in most cases of neurasthenic or neurotic disturbances, not particularly in children but in adult practice as well. He thought it might be advisable to make this one of the routine urinary tests in nervous conditions affecting children.

Dr. Godfrey R. Pisek said it was difficult to say just what one should do in these cases, for it was difficult to have directions followed. Especially in dispensary cases it was impossible to influence the children properly. For that reason he followed these cases up with his nurses. The district or dispensary nurse called on these patients to see if the directions, which were made as simple as possible, were carried out even in the environment in which the child lived.

In private practice these cases did better. It was easier to get results if one placed in charge a trained nurse or a nurse who was competent to do work in physical training. Such a nurse could visit the child three times a week, or if necessary every day. She should give the child proper exercises in deep breathing and in resistant muscle exercises. She should ask the mother regarding the condition of the child's bowels, etc., and in short keep track of the child through the mother. In this way it was possible to do what was required and really have orders carried out.

Dr. J. Warren Van Derslice, Assistant Professor in Pediatrics, Rush Medical College, Chicago, Ill., said that these cases of hyperaesthesia in childhood constituted a very important group that came under observation almost daily. These cases were of immense importance from an economic point of view because of their potentiality. In his opinion it was undoubtedly a fact that in many of these cases there were the early beginnings of a later organic brain disease. With regard to the etiology he was not so sure of the role that heredity played. In the family histories of these children as with all children but few would stand a close scrutiny as to some members not having had some neurotic taint. This is the age of neuroses. The artificial life the people are living must develop these conditions in great number. He was of the opinion that if a proper home environment could be established with the development of responsibility within the child it was possible to do these children a great deal of good. The physical condition of the child was the prime factor in a very large percentage of the cases. He believed that the digestive disturbances were due in part to the low grade of nutrition and advocated hunger as the best tonic to the digestion. He placed these patients on a very limited diet. The cases should be kept under observation for a considerable period.

DISCUSSION ON DR. MILLS'S PAPER.

Dr. J. Warren Van Derslice said that the subject brought up by Dr. Mills was one of universal importance and interest. The subject of vacation schools is of vast moment to the well-being of many children. That to the generality of children the vacation should be a period of rest needed no argument, but there was the group of children reared in the slums to whom the vacation school was not only welcomed as a relief from the unwholesome home environment but from a sociological point of view these children were kept under proper surveillance that tended to uplift while if allowed to roam the streets they were mere pupils in crime. In Chicago the vacation schools have been supervised by a board of women who have done their work well. He was not in favor of shortening the school year. Shorter school hours did not appeal to him. His objection to the school hours did not lay so much in the length of the school day as it did in the arrangement of the schedule. For the primary grades there should be no lesson period longer than fifteen minutes. The practical arrangement of such a schedule was easily demonstrable. If there was a lesson period of fifteen minutes only, and then a recreation period following, over fatigue would not occur in the normal child. Home work should not be allowed.

Dr. William C. Hollopeter said that Dr. Mills's paper was so exhaustive and covered such a large field that it was difficult to pick out any special point to emphasize. However, the point he had in mind and which he hoped to bring before the Association was the one just brought out by Dr. Van Derslice. Every physician who examined school children should try to convey to the teacher the fact that a child eight or ten years old could not have his attention held longer than fifteen minutes. This limitation of time in these young subjects was a factor of much importance and, in this respect, Dr. Mills's recommendation was a step in advance.

Dr. I. L. Polozker said that in discussing the paper just read they should expect different opinions from different men depending upon the school and surroundings in the different localities.

In Detroit they had been unfortunate with their medical inspectors. They had tried to place physicians in office but this had turned out even worse than if politics had been back of it. Again too much was required of them.

He said he would rather have an eight months' course than a nine months' course, with four months' vacation divided semi-annually. It was true that some children were better off at school than at home; but this did not apply to all children. Again certain schools were built too high, too many steps to climb; often the rooms were built improperly and with little attention paid to ventilation. He believed in giving the children longer vacations. Children were now coming to the clinics with chorea and other nervous troubles because they are worked too hard and cannot hold out until vacation time.

Dr. Henry I. Bowditch, Assistant in Pediatrics, Harvard Medical School, Boston, Mass., believed that he had the "thirteenth remedy" which might be applied, increase the length of the school year by making a vacation school, a school that was an open air school. As a country America had not taken up the open air schools sufficiently; Europe and Germany especially were far ahead of us in this respect. He said he was very thankful that he was able to say that the ladies in Boston had taken this matter up and would establish this summer for two months—July and August—an open air school. The curriculum would be entirely different from the curriculum of the winter months. Outdoor work was to be taken up and much stress was to be laid upon it as a means of benefiting these children. It seemed to him that the defective or mentally deficient child would improve very much under good outdoor life, with rest, one or two healthy meals a day, etc., and with the privilege of going home for a short time at night.

Dr. E. H. Bartley, Professor of Chemistry, Toxicology and Pediatrics, Long Island College Hospital, Brooklyn, N. Y., said that the subject of what to do with the mentally deficient child in school was a most important one. The method hit upon as the best solution of the problem was to establish special classes, grading the students according to their abilities, and putting them in separate classes; they might be called upon to make two or three grades for the mentally deficient, according to the progress they made in their studies.

In Dr. Mills's recommendations he brought up another subject, i. e., the subject of school pressure, which was always a fruitful subject of discussion, and one which often brought a riot when mentioned. They should not be unmindful of the fact that the present school year had developed as the result of many years of experience, and it had long been settled that nine or ten months should be the school year. It seemed to him, however, that the length of the school year was not the question. The difficulty was in the pressure that was applied during the school year. If they would talk with the school teachers they would find that they were compelled to make the children do so much work; the classes must go over so much ground in order that the children may pass their examinations. The teachers themselves had no choice in the matter; the choice rested with higher authority. In the old days when the school teacher was the sole judge nothing was said regarding school pressure. But when they formed a school system with a Superintendent of Instruction then the teacher was compelled to do what was demanded by the Superintendent.

The Superintendent sat in his office and planned the course compelling them to go over a certain amount of ground in a certain length of time. Dr. Bartley believed that it was the pressure at the top of the system that was at fault and not the number of hours required for work. The teachers were compelled to go over the amount of ground required by the Superintendents. He believed that if the pressure was taken off, there would be no complaint about the school year being too long.

Dr. Bartley said he could not agree with the recommendations contained in Dr. Mills's paper. They should attempt to lessen the pressure upon the school children, and he believed the only way to do this was to begin with the Superintendent or the school board, or those who arrange the curriculum.

Dr. LeGrand Kerr, Professor Diseases of Children, Brooklyn Post Graduate School, Brooklyn, N. Y., said that it seemed to him that Dr. Mills's paper had lost some of its possible value in the fact that it had been rather localized in some particulars and too generalized in others. There was no doubt that if they were discussing a paper which dealt with the Philadelphia schools and the conditions there, they could only commend the paper; in that way the paper was dealing with local conditions; but those conditions did not exist universally. Personally he knew that such conditions did not exist in the Boroughs of New York and yet in New York they were certainly far behind the whole State of Massachusetts on the question of taking care of the mentally deficient children.

Dr. Kerr wished to emphasize one point in particular, a point regarding the over-pressure or mental over-strain of school children. It was not generally recognized, and yet it was a fact, that a child, the normal average child, between the ages of seven and nine was not as capable of prolonged physical or mental strain as was a child at other ages. Then there was a period occurring in girls between the ages of thirteen and fourteen years, lasting about five months when they were not capable of prolonged physical or mental strain. In boys as well there was the same period between fourteen and fifteen years and which lasted for about the same time.

Last year, before the Brooklyn Institute of Arts and Sciences, Dr. Kerr spoke on this very subject and gave results of some experimentation along this line. He regretted that he could not speak at length on what he then reported, but time would not permit. But he would say that a child of six years of age was more capable of more prolonged physical and mental strain than was a child of eight years, because a child of eight years was in the center of the fatigue period between seven and nine, a definite period in which the child was not capable of prolonged mental or physical strain. He regretted that he could not go more into the details of this work, but if there was anyone present who wanted to obtain the results of his experimentation along these lines, if they would indicate that want, he would see that they got the matter in proper form.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE.

EDITED BY KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic Mt. Sinai Hospital, N. Y. City.

GRAVE SEPTICEMIAS IN THE COURSE OF SKIN DISEASES OF CHILDREN.

H. Rivet (*Archiv. de Med. des Enfants*, Jan. 1909), states that in the course of Eczema or Impetigo in children, severe and even fatal manifestations may develop and believes these due to a toxin developed in the system, or perhaps, metastatic infections from the seat of the skin lesion to vital centers. Death in these cases was due to heart failure. It was formerly believed that these severe symptoms were due to the local treatment, but the author denies this as in some cases observed with fatal ending, no treatment at all was instituted. He was able to demonstrate the presence of streptococci in the blood and believes that this came about by infection through the denuded eczematous portions of the skin, which reach the general circulation. The phenomenon called by Richet "Anaphylaxis," may thus be accounted for. These facts put us on our guard in the care of skin diseases of children and isolation from other cases is the prime move.

ACUTE TREMOR IN CHILDREN.

In an interesting monograph on this subject (*Brain*, May, 1909) Reginald Miller reports six cases and gives his reasons for considering them as examples of Encephalitis of the mid brain, the former belief being that they were cases of cerebellar encephalitis. At the outset the tremor is slow, regular, and increased on voluntary movement, and when severe it is continuous during sleep. When slight it appears only on voluntary movement or during excitement. It may appear in the muscles of the head, trunk, abdomen, or limbs and is more marked in the proximal parts of the extremities. In some cases the child appears as if shivering from cold. The tremor is about five oscillations a second. Combined with tremor is Hypertonus, making the limbs quite useless and this in the absence of true spasticity. There is little loss of power. The important points in these cases are *a.* the acute onset, *b.* the tremor, and *c.* the hypertonus—differentiating the condition from cerebellar encephalitis in which there is ataxia and nystagmus or scanning speech. This disease presents many of the characteristics of acute poliomyelitis, in that both attack fat robust children and spare the thin ones. The sensational factor holds in both. The ages, one to four years are the same. Constitutional disturbances at the outset are not marked in either ailment and in both conditions, the onset is acute. In both the tendency is towards improvement or total recovery, while relapses are uncommon. Examination of the cerebro-spinal fluid in both are negative. Most cases are due to polioencephalitis, but there are some that may be due to a tubercular tumor, or a syphilitic thrombosis. The diagnosis can be made by exclusion of other possibilities. There is marked improvement in the tremor almost in all cases, but the mental deficiency that accompanies, undergoes no improvement. (*Edinburg Medical Journal*, Nov. 1909.)

CEREBRO-SPINAL MENINGITIS.

In the *New York Medical Journal*, Dec. 18, 1909, Louis Fischer reviews the history of this important disease and details the new serum treatment. Among causes he believes to be the absence of sunlight in sleeping quarters, close stifling rooms, all of which produce lessened resistance. The causative agent was usually the diplococcus of Weichselbaum, but in some a streptococcus, in others a pneumococcus was found. Weichselbaum believes the germ lies dormant in the crypts of the tonsils and pharynx, and that it reaches the meninges, via lymph channels. This microbe may also exist in the nose and from there reach the brain. The types of cases are three: mild, abortive, and the severe. (a) mild type. There is a slight malaise and a rise in temperature and vomiting. (b) Abortive type. Seen in strong children. The onset is sudden with catarrhal discharges from the nose, in which the meningococcus is found. All symptoms soon disappear. (c) Severe type. In this type there is sudden onset with a distinct chill, the temperature rising to 102 or 105 degrees. The pulse may be slow or rapid. Respirations are irregular, usually Cheyne-Stokes in character. Later there is vomiting, pain in the head and back of the neck. Delirium is common. Flushing of the cheek is often seen. The tache cerebrale is usually noted. The patellar reflex is absent and Kernig's sign is present, as is also the Babinski reflex. Either constipation or diarrhoea may occur. The joints are usually swollen, simulating rheumatism, and there is distinct petechial eruption in most cases. The pupils are dilated and irregular. Strabismus is frequent. Sometimes nystagmus and photophobia. Opisthotonus is usually present. A positive diagnosis can only be made by examination of the spinal fluid drawn by lumbar puncture. As a rule this fluid is opaque and the Weichselbaum germ is found. The author then goes on to describe three cases in his own practice, one a child of four weeks which ended fatally, the second a child of four months, who made a complete recovery, and case three, a severe case which finally recovered. In all three cases Flexner's serum was used. In all cases injection of the serum produced decided action and improvement. The author then details special symptoms noted in this last epidemic and states that facial palsy was noted in 50 per cent of cases, and it was usually unilateral. Deafness and blindness was noted in 40 per cent of the cases. The eye symptoms varied. Fischer states that the disease is usually confounded with mastoiditis, scarlet fever, septic pneumonia. With regard to the serum of Flexner the latter reports the following statistics:

No. of Cases.	Recovered.	Died.	Per Cent Mortality.
712	488	224	31.4

This was a great blessing, as formerly the mortality had been from 69 to 90 per cent. In infants the mortality was said to be 100 per cent. The author further details numerous cases which shows the great life saving value of Flexner Serum.

INFANTILE GONORRHEAL VULVO-VAGINITIS. APHTHOUS STOMATITIS.

Hollopeter of Philadelphia, writing for the *Monthly Cyclopedia and Medical Bulletin* (Nov. 1909) relates the history of a case of this kind in a child of 5 months, the infant suffering also from acute food poisoning, and gives the following treatment: Withdraw the milk; substitute barley water or meat juice; alternate until the tract is free. For the excoriated buttocks use 2 per cent Ichthyol in water. Observe a careful toilet of the mouth. Give calomel and wash out the bowels. For the Cystitis give Urotropin Gr. 2 four times daily and for 5 days, then Liq. Potassi Citratis half oz. *t. i. d.* Treat vaginitis by cleanliness and irrigation with Potassium permanganate solution 1-8000 once daily. Follow this by Argyrol 10 per cent or Protargol 2 per cent. A pad saturated with weak bichloride should be placed over the vulva. Guard the hands from carrying infection to the eyes. For food, give later skim milk ℥ XXV.

Sugar of milk ℥ 11 equals fat 6 per cent.
Lime water ℥ 11 equals fat proteid 1.8-10 per cent.
Boiled water ℥ XIV equals carbohyd. 3.1-10 per cent.
M. Sig ℥vi every three hours from 6 A. M. to 12 P. M.

Aphthous Stomatitis treatment. Colonic irrigation, also an oily inunction daily. As a mouth wash, after each feeding

℞ Potassii Chlorate ʒ1.
Acid Hydro Chlorici ʒ1.
Glycerine ʒiv.
Aqua menth pip qs ad fl ℥iii.
Sig. ʒ1 every four hours.

ANTERIOR POLIOMYELITIS.

J. H. Thursfield in the *London Practitioner* reviews the literature for 1909 and begins by a consideration of Anterior Poliomyelitis. This is one of the most important diseases from which children suffer.

The cause of the disease is unknown but the evidence leads towards an infection. Koplik writes of the epidemic of 1908 in which over 1200 cases were reported to the New York Board of Health. It attacked children of all ages. The disease did not produce the same characteristics in this epidemic (1908) as it did in others, simulating meningitis more than anything else. Koplik describes a cerebral form with stupor, fever, headache and vomiting, followed by paralysis of varying extent, some cases terminating by paralysis of the respiratory centres. Another type simulated rheumatism. These cases cannot all be considered as Poliomyelitis. Another paper is by Dr. Hymanson in which 5 cases are described. A third paper by Dr. La Fetra gives the results of blood and Cerebro-spinal fluid examinations.

PROGNOSIS OF HEART DISEASE.

In the *British Jour. of Children's Diseases*, Douglas Stanley discusses this topic. Physicians practicing in hospitals are likely to take a gloomy view of the prospects of a child suffering from cardiac disease, while doctors in private practice who can follow their cases for many years have not sufficient material from which to draw conclusions.

The author takes an optimistic view. He believes possible the ultimate cure of many severe cases of heart disease, and quotes some interesting cases. Thursfield urges that this subject be taken up by various Medical Societies all over the country and thoroughly investigated. Treatment of Meningitis from an original paper in the *Johns Hopkins Hospital Bulletin*, April, 1909, speaks of Hexamethylenamine for the cure of meningitis in which it is claimed to inhibit the growth of micro-organisms in the cerebro-spinal fluid, as demonstrated by injecting streptococci in the piarachnoid of animals, and then watching the progress of the disease. This drug is taken by mouth.

FEEBLE MINDED CHILDREN.

M. A. Potts reviews the subject of mental deficiency, which he divides into 2 classes (a) due to degenerative changes in the brain and cord. The first class he regards as small. He does not believe that "feeble mindedness is spontaneous in origin" but does not question that "feeble mindedness tends strongly to be inherited." The second class of cases includes the great majority, and it becomes important to be able to present all those influences which tend to deteriorate the germ plasm, as Tubercle, Lues, Alcohol. "Everything which interferes with true hygiene does contribute to increase the appalling number of incompatibles." Potts urges an efficient medical inspection of school children.

TREATMENT OF CHOREA.

Dr. James Burnett, in an article published last year has advocated anew the claim of Sodium Salicylate and Aspirin. He believes chorea a manifestation of Rheumatism. Burnett places his faith in Aspirin, believing this drug has produced better results than any other, and adds, that the course of chorea is shortened by its use. He makes the remark that in all cases of chorea the heart is dilated, and would thus treat all cases in bed. Massage is also recommended. The paper sums up by stating that such drugs as arsenic, zinc and sulphur are of little or no use in this disease. After all the question of the origin of chorea can only be settled by bacteriological means.

THE SEQUELAE OF SCARLET FEVER.

The etiology of this disease is still unsettled. Schick (*Jahr. für Kinderheilk*) has written an interesting paper on the sequelae of this disease, and mentions especially, post Scarlatinal rheumatism which occurs in the second week of this disease. Whether the joint pains are all rheumatic is uncertain, but Wladimeroff considers that when they are of long duration, they should be ascribed to neurotis. Nephritis is a rare complication and occurs late in the disease and is characterized by being insidious in its onset, sometimes signalized by uremic convulsions. Scarlatinal nephritis is not a lasting inflammation, most cases getting well. Herman has an interesting subject on Scarlet Fever. (*Archives of Pediatrics*, Feb. 1909) the main point being brought out is that the belief of the infectiousness of the desquamated Epithelium is erroneous. The discharge from the nose, ears and throat are of far greater import. Special attention should be paid to adenoids and decayed teeth. Herman believes that any open wound is extremely liable to become the port of entry to the infecting agent of Scarlet. A very rare complication of Scarlet Fever—meningitis—is discussed by Frost and Benard, the latter's article being a complete study of this condition, having collected 25 cases, in which the majority was secondary to suppuration of the ear and cranial sinuses. The organism isolated was usually the Streptococcus. The progress is not very unfavorable, depending on the conditions found in the Cerebro-spinal fluid.

DIAGNOSIS AND TREATMENT OF TETANY.

Prof. Chvostek in the *Deutsche Med. Woch.*, May 13-20, 1909, discusses Tetany and states that it is easily recognized, except in atypical cases. The cardinal symptoms are tonic spasms, mechanical Hyperexcitability of the motor nerves (Chvostek sign), electrical Hyperexcitability of motor nerves (Erbs sign), and the production of tonic spasm by pressure over the main nerve trunks or vessels of a limb (Trousseau's sign). A diagnosis from spasm alone is impossible, as they are often absent, while hyperexcitability of motor nerves can occur in pellagra, tuberculosis, epilepsy, hysteria, chorea, etc. Chvostek sign though is important and indicates disease of the parathyroids. The writer does not believe in the efficiency of Erbs sign, stating that it is often absent in the acute stages of Tetany.

Trousseau's sign, the 3rd cardinal symptom is of less diagnostic value than the other two mentioned. While occurring in the acute stages, in the latent period it is usually absent. Trousseau's sign may occur in cases of Hysteria, manifesting itself in exactly the same manner. During acute paroxysms muscular spasms are constantly present, with many variations from the typical. The arm may be extended, the fingers clinched, or be claw-like. In the leg there is extension of the knees and plantar-flexion of the foot which is typical of Tetany though the opposite does occasionally occur. The spasm may persist for many days and the dominant symptoms may be parasthesia and pain. In some cases the spasms are clonic. Though recovery from the spasm is the rule, Tetany is a chronic disease. Von Frankl-Hochwart states that in ⅘ of cases symptoms recur for years. That Tetany is due to disease of the parathyroids has been proven and may be classed with Goitre affections. In some cases there exists hemorrhages into the Parathyroids. Spasm usually follows some exciting cause, like over exertion, infections, diseases, intoxications, emotion, pregnancy, etc. "Tetanoid" conditions may be induced by certain postures of the body, and by injections of Tuberculin into the body.

Hoffman's sign in Tetany consists of mechanical and electrical hyperexcitability of the sensory nerves and occurs in acute spasms, but is not elicted in the internals. Of diagnostic importance is hyperesthesia to galvanism of the acoustic nerve in Tetany. Other symptoms of Tetany not so frequently met with are fibrillary twitchings, the formation of Cataract, peculiar facial expressions and various trophic disturbances.

Atypical types of Tetany may be mistaken for Tetanus and meningitis. The spasms of Tetanus involve the whole body, especially the muscles of mastication and there is Reflex Hyperexcitability. Tetany may simulate meningitis as in atypical cases of the former disease. There may be hyperesthesia of the skin, muscular pain and opisthotonus, also pyrexia, headache and ocular symptoms. However, Kernig's sign is absent as is the meningitis pulse and Cheyne-Stokes respiration. The convulsions in some cases of Tetany may be clonic and myotonic thus simulating Thomsen's diseases, multiple sclerosis, syringomyelia and hysteria. A diagnosis from the first named, especially, may be difficult. Tetany may simulate the muscular dystrophies, owing to motor weakness or neuritis. The paresis of Tetany, however, is of the relaxed variety (no contractures). In some cases of Tetany there is muscular pain and nerve pain and absence of reflexes, thus simulating Neuritis. Tetany may also appear with symptoms like that of myesthenia gravis, but the latter is diagnosed by the myesthenic reaction. Rheumatism is frequently the diagnosis in many cases of Tetany, due to the presence of parasthesia around the joints. Lastly Tetany may be confounded with Hysteria, and so much so, that in former times the first named disease was included in the list of functional neuroses. On the other hand Tetany may excite an Hysteria, or the two conditions may coexist. There may also be some relation between Epilepsy and Tetany, both diseases frequently having the same exciting causes as alcoholism, plumbism and pregnancy. The Treatment of Tetany—Prophylaxis. This is only possible in the form tetania strumipriva, that is the surgeon in operating on Goitre must not remove the Parathyroids. A mixed treatment should be advised in patients subject to this disease.

TREATMENT OF TETANUS.

Treatment of the Paroxysm. This is unsatisfactory. Organotherapy appears to be the rational means of combating Parathyroid insufficiency, but failures are many. Even in animals the onset of Tetanic parathyreopriva cannot be prevented by the giving of parathyroid substance. Prof. van Eiselberg has attempted the transplanting of parathyroid glands. The results have been good, thus far. In the paroxysm rest and warmth are essential. In the Tetany of pregnancy, rest is indicated. In that occurring during lactation the child must be weaned. Intoxications if existing must be suitably combated. In Gastric Tetany, Flexner advocates gastro-enterostomy. Medical treatment, however, is just as satisfactory, according to the author. The stomach is to be irrigated, and the patient fed via the rectum, combined with large enemata of normal salines.

In complete destruction of the parathyroids, treatment is useless, death always ensuing. Of drugs, lactophenin is useful. Bromides and morphine are useless.

INTRADERMO REACTION OF TUBERCULINE IN THREE HUNDRED CHILDREN FROM ONE TO FIFTEEN YEARS.

Charles Mantoux, of Cannes, and Jules Lemaire have practiced intradermo reaction with tuberculine, following the usual technique, on three hundred children, age from one to fifteen years, in the Hospice des Enfants Assistés. These subjects, who were not sick, gave the following results:

Age	Number Children	Negative Results	Positive Results	Percentage
From 1 to 2 years	32	26	5	16%
2 to 7 years	35	17	18	51%
2 to 7 years	84	28	56	66%
7 to 15 years	150	23	127	84%
Total	300	94	206	

These figures show the extreme frequency of latent tuberculosis in children who are apparently in good health, and the proportion of positive results increases with age in a very rapid manner, so that with well grown children the absence of a tuberculine reaction becomes almost an exception.

It should be noted that these children belong to a special category in social life, and that the results obtained with them cannot be applied as a general rule to all children of the same age. As a matter of fact, these children belong to a class who are in miserable circumstances of nutrition, hygiene and ordinary comforts, exposed to becoming tuberculous, and if their parents are obliged to temporarily give them over to the government's care, it is because they have not the means to support them, and in a number of cases they remain a long time in the hospital. (*La Clinique Infantile*, 1909, p. 524.)

BOOK REVIEWS.

Modern Clinical Medicine. Diseases of Children. Edited by Abraham Jacobi, M. D., LL. D., Consulting Physician to Mt. Sinai, Bellevue, Babies' and other hospitals, New York. Translated from "Die Deutsche Klinik" under the general editorial charge of Julius L. Salinger, M. D. Octavo, pp. 843. Illustrated. New York and London: D. Appleton & Co. 1910. (Cloth, $6.00.)

The volume consists of a number of chapters or monographs by the master minds of national or international repute, so interwoven that unless aware of the fact, you would judge that the work was that of an individual. Only affections which differ from the adult type receive attention. Amongst the contributors are such celebrated authorities as C. Keller, Berlin, "Diseases of the New-Born in the First Days of Life," are very comprehensive and most interestingly presented; Ad. Cznerny, Breslau, "The Feeding of Children"; H. Neumann, Berlin, "Infantile Scurvy" (Barlow's Disease); H. Finkelstein, Berlin, "Hereditary Syphilis"; A. Hoffa, Wuerzburg, "Infantile Spinal and Cerebral Paralyses" and other nervous diseases of infancy and childhood are exceedingly instructive; A. Baginsky, Berlin, "Diphtheria and Diphtheritic Croup"; O. Huebner, Berlin, "Scarlet Fever"; O. Huebner, "Measles, Morbilli, Rubeola"; H. Gutzmann, Berlin, "Speech Disturbances of Childhood." Among other subjects treated are "The Most Common Infections of the Oral Mucous Membrane in Children," "Acute Digestive Disturbances of Infancy," "Chronic Digestive Disturbances of Infancy," "Rickets," "Infantile Scrofulosis and Tuberculosis," and so forth.

The diversified gifts of the distinguished editor are well exhibited by his judicious foot notes and references. He says the monographs comprising this volume are so well written, and so admirably translated (by that finished scholar Dr. Julius Salinger) that no extensive editing could have possibly enhanced their value. The text, throughout the book, conveys everything that is worth while, "it is complete but brief, brief but lucid, lucid and in part eloquent, and easy reading."

The Appletons, as usual, have produced a valuable contribution to pediatric literature, which at the present time is overflowing with new text books on Diseases of Children, but this volume has many features which should commend it to the American Medical profession.

The illustrations are rather few and limited chiefly to the orthopedic department. The volume is well suited to the Pediatrician, who will find in its pages much of benefit, and to the student it will be found an invaluable aid in the study of Diseases of Children. The work as a whole is a valuable addition to any Medical library and the editor heartily commends it.

Practical Medicaine Series Pediatrics edited by Isaac A. Abt, M. D., Assistant Professor of Medicine (Pediatrics Department) Rush Medical College with the collaboration of May Michael, M. D., Orthopedic Surgery edited by John Ridlon, M. D., Professor of Orthopedic Surgery, Northwestern Medical School with the collaboration of A. Steindler, M. D. Series of 1909 under the general supervision of Gustavus P. Head, M. D., Professor of Laryngology and Rninology, Chicago Post Graduate Medical School, Chicago. The Year Book Publishers, Volume VII. (Price, cloth $1.25, entire series $10.00).

This handy little volume contains a valuable collection of excerpts of advances made during 1908 in diseases of children and orthopedic surgery. The volume opens with a dissertation on diseases of the new-born, followed by chapters on hygiene and dietetics, and the more important diseases of later infancy and early childhood are also very cleverly portrayed in the department of Pediatrics, which is clearly and succinctly written by Dr. Abt with the assistance of Dr. Michael. The section of the work devoted to Orthopedic Surgery covers very satisfactorily the diseases of the hip joint, the spine, and all of the larger joints, as well as infantile paralysis and a miscellaneous group of affections and injuries, all of which are important to any and every physician who assumes to treat diseases of infancy and childhood. The book is well arranged for ready reference having a splendid index. It is an important addition to the Year Book Series.

The Every Day Diseases of Children and their rational treatment, by George H. Candler, M. D., of Chicago. The Clinic Publishing Company, Ravenswood Station, Chicago, Ill. (Cloth, 370 pages, price $1.00.)

This little volume is not intended for the Pediatrician, who makes a special study of children and their disorders, but for the every day general practitioner, who after all treats more ailments of children and sees more pathological conditions which afflict immature humanity than all the pediatrists put together. The volume contains nothing of a theoretical nature, but only well tried and proven facts, hints—just like the information which we all so often need and rarely find.

Webster's International Dictionary of the English Language. Thoroughly revised and much enlarged under the supervision of Noah Porter, D. D., LL. D., with a voluminous appendix to which is now added a supplement of twenty-five thousand words and phrases. W. T. Harris, Ph. D., LL. D., Editor-in-Chief. Handsome leather bindings, thumb indexed. $12.00. G. & C. Merriam Company, Springfield, Mass., 1910.

It was with a feeling of pride that we examined this magnificent work, pride that it should have emanated from a distinguished American scholar, and that while the original edition made its impress, this volume, the evolutionary product of that has been welcomed by the entire English speaking world, and is considered authority in all lexicographic matters by students and scholars everywhere.

No intellectual workshop has a complete armamentarium when there is absent from its shelves Webster's International Dictionary. We have a copy constantly at our elbow in the editorial office and another in the home for the family—in both places it holds sway as our only authority.

MODERN METHODS OF TREATMENT OF TUBERCULOSIS.

While we must recognize that medication in the treatment of pulmonary tuberculosis can only take a secondary place as compared with diet, hygiene and favorable climatic conditions, the craze for complete therapeutic nihilism should not entirely prevent the use of such remedial agents as may materially assist the patient in the process of repair of certain lesions and bring about such comparative immunity as will arrest the progress of infection of further pulmonary tissue. There has been a too decided tendency in recent years to make our patients believe that medication is useless; this is not only a mistake from the psychic point of view, but a mistaken view of the subject. We should by all means endeavor to give confidence to our patients, by relieving their symptoms as they arise, with appropriate drugs, and the effects of such time-honored remedies as creosote, combined with the active principles of cod-liver oil (morrhuol) should not be despised, and should be considered to have a distinctly useful bearing on the modification of spongy lung tissue in which the tubercle bacillus has gained an entrance.

Creosote is not well borne by many patients, but in combination with morrhuol it does not appear to be detrimental to the gastric mucosa or to affect the renal epithelium, while it is well established that it is a leucotactic, and as such may be considered as a blood antiseptic, preventing migration of free tubercle bacilli, and more especially such micro-organisms as the streptococci, which are the active agents in distributing the infection from an existing nidus and causing a rise in temperature. The active principles of cod-liver oil, on the other hand, are well established diuretics and stimulants to metabolism and nutrition, and as such cannot be otherwise than beneficial to patients whose vitality is impaired and where superalimentation is most desirable in order to replace the tissue waste and diminished immunity to the disease.

ADRENALIN IN A NEW PACKAGE.

In addition to the ounce vials in which it has hitherto been supplied, Adrenalin Chloride Solution is now being marketed in hermetically sealed glass containers of 1 cubic centimeter capacity.

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As will be apparent from the foregoing, the Adrenalin Ampoule is intended ıor hypodermatic use. It should be of great value in such emergencies as shock, collapse, hemorrhage, asthma, etc., or where prompt heart-stimulation is desired.

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EDITORIAL

THE ANEMIAS OF INFANCY.

Until the intelligent interest of the general profession is aroused upon this topic, scientific advance in our knowledge will be much crippled. The present literature shows little more than a good beginning in the right direction. We have first of all to unify the terminology; this shows at present needless variation even in words applied to comparatively well-defined morphologic constituents of the blood. The next thing, and the most important thing, is a more rigid and thorough clinical study of the cases. Under the title of "V. Jaksch's Disease," for example, or "Anemia Infantum Pseudoleukæmia," no less than four or five distinct disorders of the blood in childhood have been described by various authors. And the data of the reports are often so loosely set down that a competent hæmatologist is unable to do more than guess at what the disease actually was. To a more exact clinical study of the blood there are requisite only a few conditions, but these must be perfectly fulfilled. We think it safe to say that several months should be given to practice in counting red and white cells before a physician should trust his numerations. Even the making of films requires repeated efforts; and without accurate attention to each detail of preparation of the covers the stain will not be satisfactory or intelligible. The methods of estimating hemoglobin by V. Fleischl's and Gowers' instruments are so dependent on the "personal equation" of the observer that it would be a safe rule for all except the most experienced to use the "specific gravity method" instead. If the writer's time is short, it should be given exclusively to making an "Ehrlich stain." This gives far the most extensive and important information on *diagnostic* points. It shows readily the character of the red cells, nucleated reds when present the relative number of whites and reds, the character and relative proportion of the various types of whites. A differential count of the whites—an indispensable factor in diagnosis—can also be most easily made with the same stain. One other point (upon which R. C. Cabot has wisely laid stress) is a careful statement, not merely of the age of the child in years and months, but of his actual development. This includes number and character of the teeth, condition of the fontanelles and epiphyses, the mental and muscular advancement, and, perhaps, also the diet and hygienic conditions. Where the observer has not time or instruments at his command, he need only mail some properly prepared films to one of the laboratories where such work is now constantly being done. We are already finding that a blood examination in difficult cases is just as essential to a correct diagnosis as the percussion of the lungs or testing of the urine, and in specific diseases of the blood, whether primary or secondary, no observer should be satisfied with anything less than a complete description of the hæmic condition.

PEDIATRICS AND ORTHOPEDIC SURGERY AS SPECIALTIES IN MEDICINE.

As a specialty, pediatrics covers a broader field than that of any other specialty in the domain of medicine or surgery. Pediatrics embraces all the disorders of childhood, whether medical, surgical, or belonging to any specialty. The need for more earnest workers in, and more study of, this specialty is at once evident when you stop to consider that more than fifty per cent. of the children born in this country die before they reach the age of six years. Alarming, isn't it? Well, it is so nevertheless, and no field is more enticing or more remunerative as a specialty than pediatrics.

"The potential energy of an infant saved from death by proper medical care and nursing supervision cannot possibly be reckoned. The future of these little lives cannot be foretold as can the lives of adults saved from disease. It behooves us, then, as physicians to investigate thoroughly every source of this appalling death rate, and to make them known to the public, at the same time suggesting remedies."

The talented editor of the Charlotte Medical Journal in commenting on this specialty recently voiced the following conclusions:

Many will perhaps disagree with the statement that of all the specialties in medicine and surgery, Pediatrics and Orthopedic Surgery are the two least thought of by those of the profession who seek to practice a specialty, while general surgery, general medicine, eye, ear, nose, and throat, surgery of the genito-urinary tract, gynecology, etc., are first thought of by those who want to leave the ranks of the general practitioner. And in fact in many of the medical schools the Chair of Pediatrics is included in the Department of Medicine as a small subdivision with a few lessons for the student, and Orthopedic Surgery is put in under the head of General Surgery and no special attention given to it at all. Of course every general surgeon believes himself quite competent to diagnose correctly and treat properly any orthopedic case that may come to his notice and really to doubt that the ordinary general medical man is not a finished pediatrist is to be a non-believer in "the Gods that be." However, the cold, bare, unvarnished truth is that the average general surgeon is not at all a reliable orthopedic surgeon to do business with, and, whisper it softly so as not to jar anyone's feelings too much, many, oh! so many medical men far from being pediatrists do not even know how to carry a baby properly, much less examine it and diagnose its ills correctly. And of course under these conditions they cannot treat intelligently and successfully, the infant often getting well in spite of the doctor. And when it comes to infant feeding—but why "rub it in," if we may use a little slang?

The two specialties go very well together as the great majority of orthopedic cases are children, although of course many adults must also be treated for orthopedic conditions. The thorough knowledge of pediatrics assists materially, as regards diet and therapeutics, in making a better progress in your orthopedic cases. Therefore the object of this editorial is clear. It brings to your notice two opportunities for success in medicine neither of which however can be attained to unless one is willing to study hard and work hard constantly to master the subject thoroughly. Neither can be mastered sufficiently to render unnecessary continuous study and clinical work. "The world do

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ORIGINAL ARTICLES

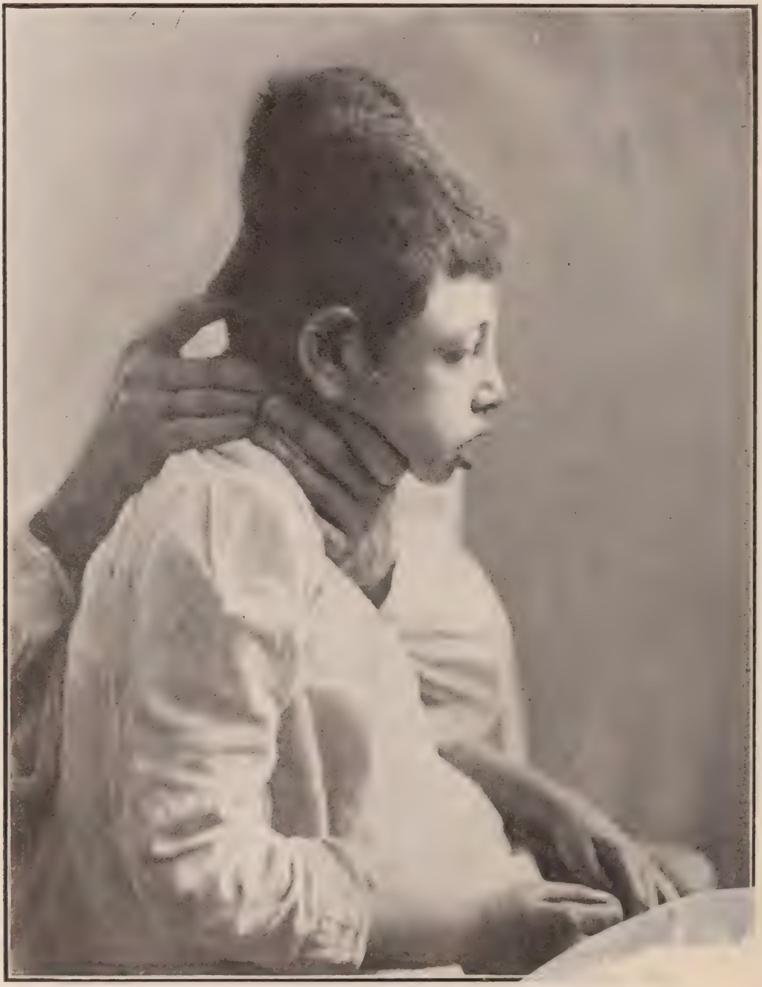
A CASE OF ENCEPHALOCELE.

By LOUIS FISCHER, M. D.,

Attending Physician in Charge of the Babies' Wards of the Sydenham Hospital, and Attending Physician to the Willard Parker and Riverside Hospitals, etc.

William Cohn, age 5 years was admitted to the Montefiore
6. He was a small sized child. Nutrition poor.
ild as compared to upper part is abnormally
ild assumes a crossed legged posture.
Knee jerks markedly increased,
onus. Manipulation of the lower

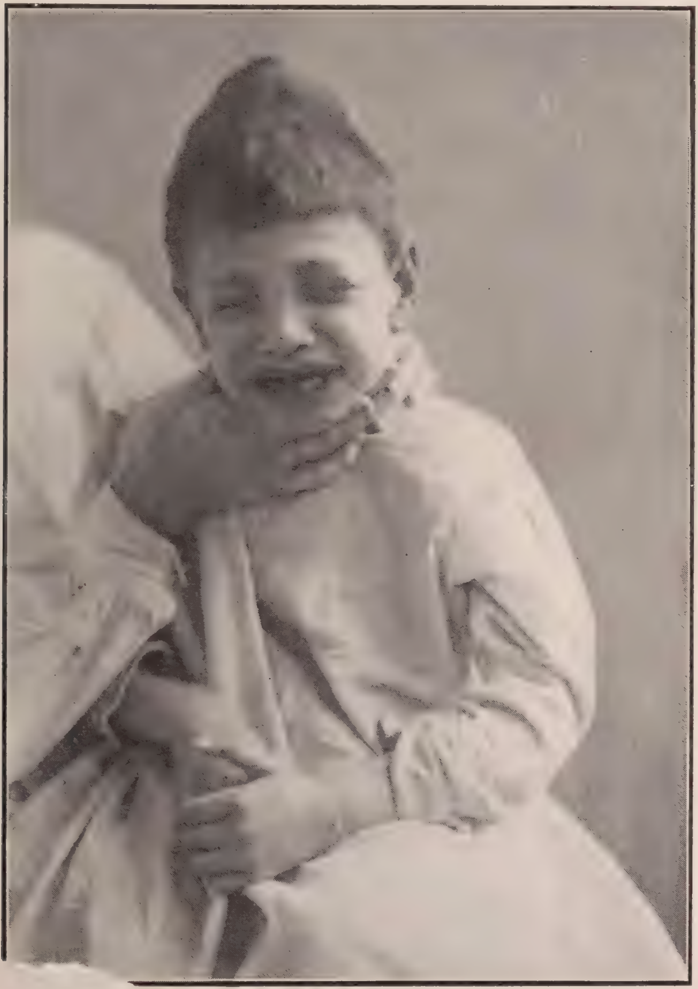
Reflexes of Upper Extremities.—Triceps not obtained (probably on account of the rigidity). Wrist jerks are well marked. All abdominal reflexes are absent. No Babinski. Plantar stimulation on right side gives extension of all the toes, while on the left side, flexion of all results. Cremasteric reflex absent.



Pupils do not react to light. Right [illegible] sation apparently preserved.

The child is able to move spont [illegible] thighs and hands. There is a [illegible] foot and also a drop wrist on right side. There is considerable rigidity in all four extremities.

The Head.—The head is conical in shape, the apex being formed by a protrusion arising from the upper and middle part



protrusion is about the size of a large cocoa-
his tumor is covered with normal hair. On
and arises from the anterior fontanelle
far as the posterior fontanelle.

The sagital suture at its widest part measures about 6 inches. Tumor fluctuates and on pressure causes apparent pain, and invariably the toes and fingers are set in motion. At the posterior surface of the tumor is a follicular cyst. The child is apparently deaf and blind. Teeth are decayed. Child cannot apparently protrude tongue. There is a marked stomatitis. Nose is broad, obstructed and a discharge is present.

Palate is high arched, not cleft. Thorax well developed. Heart is rapid in action, pulse 110 per minute. Breathing puerile—no abnormalities. Abdomen small and narrow. Liver and spleen not palpable. Abdominal muscles are held rigid. Testicles small.

Further examination impossible on account of high temperature. The above history was given me through the courtesy of Dr. David Felberbaum and Dr. Weinstein of the Resident Staff.

William Cohn, 6 years old, was admitted to the Willard Parker Hospital, June 4th, 1907, suffering with diphtheria and croup. There was a slight exudate on each tonsil. Nasal discharge very slight. Croup disappearing in three days. Culture of nose and throat gave a positive Klebs Loeffler.

Father and mother both well developed, and both of moderate intelligence. Normal labor.

Family History.—There are ten living children out of eleven. One child died of diphtheria when 2½ years old. Nine out of these living children are physically and mentally normal.

During the eighth month of pregnancy, the mother fell, and was confined three weeks later. To all appearances a full term child. No forceps were used. It was a normal delivery and a silk string was used to tie off the umbilical cord.

The infant was breast fed one year. Has had measles
scarlet fever.

Child always nursed well and ate well. F
Mother says child can neither hear nor see

Physical examination shows under
nourished. A tumor mass in pariet
bony edge 2 inches above the ex
inches above the glabella. The

reaction from pressure—restlessness. No convulsions or slowing of pulse. No impulse of mass on coughing.

Pupils equal, react sluggishly to light. Apparently no sight or reaction to hearing.

Fingers pointed and tapering, athetoid movements of hands constant. Remainder of physical examination, negative.

Discharged, June 23, 1907.

The above data were given to me by Dr. Clarence C. Coryell, Assistant Resident Physician of the Willard Parker Hospital.

162 W. 87th St.

ADOLESCENCE AND HYPERTHYROIDISM.*

BY FRANK BETHEL CROSS, M. D.,

Assistant Physician to Methodist Episcopal Hospital, Brooklyn, New York.

The embryology of the thyroid gland reveals the origin and similarity of the thyroid, accessory thyroid, suprahyoid, prehyoid and lateral thyroid glands, all of which have the characteristic thyroid structure. On the other hand, the parathyroid glands are of a distinctly different type and, while ultimately they may come to be imbedded in the thyroid tissue, the relation is purely geographical.

The remarkable blood supply bespeaks an active and necessary gland. The most plausible explanation of the physiologic activity of the thyroid gland is dependent upon the supposition that the thyroid secretes an *active substance* which passes into the general circulation through the medium of the lymph vessels. Not knowing the range of physiologic activity of the gland, we cannot state that a given activity will produce specific results, nor can we be certain that the secretion does not vary from time to time in quantity, strength and composition. Does it come into direct chemical relation with the tissues of the body and there destroy the toxins of metabolism, or prevent their formation, or is this action indirect through the agency of the central nervous system or other body glands? We do know that it is unlikely that the metabolic toxins are brought to the thyroid for neutralization, for in Cachexia Strumipriva, for instance, thyroid feeding is beneficial even though functionating thyroid tissue is absent from the body. The ultimate destination of the secretion is at present unknown; its union with the toxins or with the tissue cells of the body may result in its destruction, or it may be reabsorbed and returned to the thyroid, there to be rendered again specifically active.

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*Abstract of paper read Oct. 27, 1909, before Section on Pediatrics of Medical Society of County of Kings.

A chemical study of the gland gives us positive information. In 1896 Baumann established the fact that *Iodothyrin,* a non-proteid substance known also as Thyroiodin, is combined with a proteid material, the Thyrogen of Blum, to form the Thyroglobulin of Oswald. Iodothyrin is a brownish amorphous material remarkably resistant to chemical and physical agents, contains 9.3% of iodin and is chemically the same, whether of human or animal origin. It is generally found in the colloid material of the gland. Oswald's Iodin-free Thyroglobulin, the nucleo-proteid of Oswald, Fraenkel's Thyroantitoxin and Dreschel's basic products are all free from Iodin and are not specifically active. The Iodin acts not as Iodin but as Iodothyrin and this latter substance possesses a distinct physiologic action. The Iodin content of the gland may vary and is itself not an index to the physiologic activity of the thyroid. Thus we may get hyperthyroidic symptoms from a gland found afterwards to be poor both in colloid and Iodin, and with a simple goitre rich in colloid and Iodin we may discover no relative hyperthyroidism.

The *physiologic action of the thyroid secretion* is determined in part by a study of animals deprived of their thyroids and of animals overfed with Iodothyrin, from the observations made, deductions being drawn and quite an exact idea of the effects of the thyroid secretion on the human economy being formed. The secretion has a selective influence on metabolism in general and is essential to normal growth. Nitrogen metabolism is promoted and yet wasteful metabolism limited; it is as though the thyroid acted as a "governor." There is a specific influence on the nervous system and indirectly an effect upon the blood vessels. The skin and epithelial tissues are strongly influenced in their growth and functions; likewise the growth of the osseous system appears to be partly under thyroid control.

Despite the handicap of not knowing the range of normal thyroid activity and of not having any means of determining it, from a study of the grosser thyroid disturbances we are learning to appreciate the lesser disturbances. This field promises a considerable future.

The hyperthyroidic diseases are not numerous, but are readily recognizable. We must first appreciate that while enlargement of the thyroid is usual in hyperthyroidism it is not essential, as is seen in the cases of exophthalmic goitre without the goitre; nor is thyroid hypertrophy alone indicative of over secretion. Simple goitre exists without hyperthyroidism, and an enlarged thyroid may even be present when the clinical picture is one of hypothyroidism.

Hyperthyroidism is the result of overactivity of the thyroid gland to a degree that metabolic, nutritional and nervous symptoms manifest themselves.

Congenital goitre, seen occasionally, is not accompanied by hyperthyroidism. *Simple goitre* presents no symptoms pointing to hyperthyroidism originally, but later in the disease these symptoms may manifest themselves and the condition merge slowly into an early stage of Exophthalmic Goitre. The disease appears at puberty and is more frequent in females. It so happens that I have yet to see a case in a male. The glandular enlargement is generally bilateral, in some cases the right lobe showing the larger increase; the enlargement may be nodular. The gland structure is firm but elastic and is distinctly not fibrous. I am unable to account for the development of simple goitre, though it has been variously attributed to drinking water; this in special localities where goitre is common—northern New York, for instance. Virchow's statement that there is a tendency to thyroid overgrowth because of the very marked blood supply provides a possible explanation. The treatment is non-operative; Iodids for a long time, Iodin locally over the gland, and a change of drinking water. With this treatment Kocher states that he expects 90% recovery of cases in children.

Inflammation of the thyroid may develop in the course of any infectious disease and follows the usual course of any suppurative inflammation. We do not expect hyperthyroidic symptoms in this disease.

Thyroid Hyperemia is a disturbance to which I wish to call especial attention. For several years I have been seeing this condition and, upon consulting reference text books, have found pediatric literature quite barren of comment on this affection. The condition arises at puberty and all my cases have been in girls. The gland is symmetrically enlarged, occasionally the right lobe slightly in excess; the gland is firm but yielding; no bruit is felt or heard. There is usually a moderate simple anemia. There may or may not be a tachycardia. The patient is markedly nervous; there may be a slight tremor. In two cases there was a tendency to exophthalmos and the entire picture was that of a mild Exophthalmic Goitre and yet recovery was prompt, there was no return of the disease and the resemblance to Parry's disease was in the end only a simulation. This transient hyperthyroidism, which in adults may be seen at menstruation, during pregnancy and in sexual excitement, is in reality more or less physiologic and represents the over-response of the thyroid gland to the stimulation of altered nerve activity and, in the cases above mentioned, to the special altered internal secretions manifest at puberty. The *course* of Thyroid Hyperemia is short. With proper treatment the condition should disappear in a few weeks or months; in some cases the subsidence of the disease is spontaneous. The *treatment* is largely a matter of hygiene. Rest from school activities, life in the open air, preferably in the country, good nourishing food, a change in the drinking water and an avoidance of nervous excitement are the prominent features of the treatment. The anemia corrected, nerve sedatives as required and arsenic in small doses for a retarding influence upon the gland activity complete the therapy.

Exophthalmic Goitre is quite properly a disease of adolescence since many cases develop before the age of 20. All indications point to its being of hyperthyroidic causation, or, as Kocher names it, a Thyrotoxicosis. The etiology is obscure, though there may be a family or individual history of thyroid disease, the patient may have been subjected to long mental worries or to a sudden emotional shock, or the disease may have been preceded by an acute infection of the tonsils and throat, or by tuberculosis, acute rheumatism, scarlet fever, typhoid fever, measles, mumps or malaria. In adult females, the disease may develop from 3 to 8 months after conception or during the puerperium. I shall refer you to the text books for the symptomatology.

The medical *treatment* insists upon relative rest and, when the great metabolic losses of this disease are taken into consideration, the need of this is apparent. The diet should be nutritious but non-stimulating, and should be outlined for each individual case. Bromides to lessen the nervous symptoms, heart sedatives to quiet the overacting cardiac organ, ferruginous compounds for the anemia are all warranted. Arsenic specifically combats the excessive metabolic changes. Quinine is similarly used. I have had no experience with galvanism.

In *Thyroidectin* we have an easily obtainable agent of value which affords in some cases temporary relief from the hyperthyroidic symptoms, but when we take into consideration its origin from the blood of thyroidectomized animals we can understand why it will not be possible to effect a permanent cure. It is possible that its constant administration will keep in abeyance the symptoms of this disease and this will be of distinct advantage in some cases.

The *Rogers-Beebe serum,* obtained from the blood of rabbits after injecting them with the combined precipitated nucleoproteid and thyroglobulin of thyroids obtained from cases of accidental death, has given good results. The serum is cytotoxic, containing the antibody or cytolysim for secreting diseased thyroid epithelium. It is standardized by an agglutinating test similar to the Widal reaction. The serum is injected in doses of from 10 to 16 minims, the dose repeated every 1, 2, 3 or 4 days. The injection is followed by evidence of local irritation and, in some cases, general symptoms of malaise, increased nervousness and acceleration of the heart's action, lasting from 12 to 24 hours. On the subsidence of these symptoms, if the patient responds favorably to the serum, he is better than before the treatment and each successive treatment is followed by improvement. The frequency of administration of the serum depends entirely upon the character of the reaction to the injection.

Personally I am in favor of the surgical treatment of *partial thyroidectomy*, although the treatment depends upon each individual case. To my mind Kocher's report of 200 cases with 85% of recoveries speaks for itself.

141 Seventh Avenue, Brooklyn.

REPORT OF DEATH DUE TO STATUS LYMPHATICUS.

By Paul L. Parrish, M. D.,

Brooklyn, N. Y.

In reporting a case of sudden death supposed to be due to status lymphaticus it may not be amiss to briefly run over what is known of this rather obscure condition.

Status lymphaticus may be defined as a condition in which there is a considerable hyperplasia of the thymus gland, in many cases accompanied by a general lymphatic hyperplasia, in others the only abnormality present seems to be the enlarged thymus.

The thymus gland is situated upon the trachea and great vessels, extending from below the thyroid down to or upon the pericardium. Its average weight may be stated as 6 or 7 grams, the weight increasing little or none after birth in most cases. It is probable that normally after the second or third year it begins to be replaced by fatty or fibrous tissue, though its weight and bulk may not decrease any. The gland sometimes is found present in late adult life. Bovaird and Nicoll give as the result of the post-mortem examination of 495 specimens an average weight of 5.9 grams, with very little variation in average weight from time of birth to the age of 5 years. There were wide individual variations, as from 1 gram or less to 33 grams. The gland was occasionally not found. Freidleben in an examination of 141 glands in children of from 1 to 5 years of age found an average weight of 7.4 grams. His statement often quoted as giving the average weight at 20 grams included only glands taken from well nourished children dying suddenly. Dudgeon of London thinks the normal weight at birth is from 7 to 10 grams. Warthin of Ann Arbor gives the average weight at birth as 7 grams. Howland thinks that any gland weighing over 10 grams is distinctly pathological.

The gland is usually found smaller than normal in all wasting diseases such as marasmus and diarrhoeal disorders, and larger in the acute infections, rickets and congenital syphilis, etc.

Of the function of the gland little is known. Some writers class it as a ductless gland, others as simply part of the lymphatic system. Some investigators think there is a relation between the function of the gland and the vegetive functions of the body, as the development of the bony skeleton, sexual organs, etc. Weintraub and Mayer have shown that thymus feeding causes a great increase in the elimination of uric acid. Some investigators have shown that in rabbits and dogs its removal causes symptoms of intoxication, with death in a few weeks. Others have denied this. Basch claimed that its removal in dogs caused an increase of the elimination of lime salts with deficient ossification. Konig saw in the case of an infant 9 weeks old whose thymus had been removed a rapidly developing and severe rickets. Paton and Henderson claim to have found a relation between the thymus and testes, removal of the thymus caused a more rapid growth of the testes, castration caused a delay in the involution of the thymus.

The symptoms of condition caused by an enlarged thymus may be divided into several classes; first that group of cases in which after some slight shock as the administration of an anesthetic, or a slight operation, usually in well nourished children, they become suddenly very sick, with rapid respiration, often marked cyanosis, cough, convulsions, usually high fever, weak pulse, sometimes digestive disturbance, loss of consciousness and death, with post-mortem showing nothing markedly abnormal except an enlarged thymus. Second, that group of cases which with or without some shock die almost at once, sometimes found dead in bed, cases in older persons have occurred immediately after going into the water for bathing, Dudgeon who has had large experience in London in the coroner's office thinks that many of the cases supposed to be due to overlying are of this type. The case reported belongs to this class.

Third, that group in which lasting over a variable period there are symptoms of dyspnoea which may come and go, may be very intense with cyanosis and with no appreciable cause, may be convulsions at times, sometimes suddenly die, or may die of some intercurrent trouble. In connection with an enlarged thymus being found not uncommonly when death is due to the acute infections it is suggested that its presence may cause a diminished resistance to these infections.

Fourth, that group in which the thymus is large enough or when acutely congested is large enough to cause pressure strong enough to occlude or partially occlude the trachea, with obstructive breathing. Warthin reports such cases and in his opinion this is the common cause of death. He divides the cases into "thymic stridor," "thymic asthma," and "thymic death," gradations of the same condition which he considers due to pressure on the trachea of the enlarged thymus. In the first class there is audible breathing or more pronounced loud breathing, with a loud inspiratory sound and signs of obstruction. In the second class there are severe asthmatic attacks due to obstruction and often ending in death. In the third class there may be no premonitory symptoms and case may suddenly die from tracheal stenosis and laryngeal spasm of sudden onset, child may be found dead in bed. He has proven his cause by, in acute cases, relieving the condition by passing a tube down below the thymus and so relieving the obstructed breathing. He has also found evidence of obstruction post-mortem. There have also been cases in which the gland has been removed or has been stitched to the sternum with subsequent relief of symptoms.

These cases must be the exception rather than the rule as there is still much doubt expressed by many careful men as to the possibility of the soft thymus ever causing sufficient pressure to cause death, or to very seriously affect breathing. In the discussion of a paper read by Dr. Warthin recently in New York, Holt said that most of his cases usually presented before death symptoms of great prostration, dyspnoea, cyanosis, convulsions and fever without obstructive breathing; Howland said he had not seen a case post-mortem where there was obstruction and quoted Freidleben and Richter and Paultoff as not having seen it; Bovaird had never seen compression. Northrup thought that extreme enlargement must be necessary to cause it.

Most observers seem to think that in these cases of sudden death there is some toxic substance suddenly liberated from the thymus or from some organ whose function is in some way associated with the thymus which causes the sudden death.

The treatment will of course depend on a diagnosis having been made. If a diagnosis is made in the cases where there have at times been symptoms as in class three and four without death, treatment may be of some benefit. It is of course necessary to improve general health, treat any disease present, keep the child in normal atmosphere and free from excitement. Operations not absolutely necessary should not be performed. Cold baths avoided.

Some cases have been reported improved by X-ray treatments.

Where obstruction to breathing is apparent and the enlarged thymus can be made out, an operation with removal of the gland or stitching the gland to the sternum may relieve obstruction. Warthin recommends passing a tube beyond the obstruction. It may be important in these cases not to allow the child's head to be thrown far back as tending to diminish the critical space at top of thorax.

CASE REPORT.

Edith W. Age 25 days, admitted to St. Christopher's Hospital June 16, 1909, suffering from a moderate purulent ophthalmia which she had had since shortly after birth. She was a full term baby and had been fed on condensed milk, she was fairly well nourished, weight on admission 9 lbs. 13 oz. History aside from sore eyes, negative. Examination shows moderate discharge of pus from both eyes, buttocks red, inguinal glands somewhat enlarged, heart normal, few dry rales heard over the lungs, liver one finger breadth below free border of ribs, spleen not palpable.

The child was in the hospital 21 days during which time it ran a normal course and the eyes got well. It had remained on condensed milk and had had no digestive disturbance and was ready to go home. Its temperature had at no time been above 100, most of the time it ran from 98 to 99. Its weight one day before it died was one oz. less than on admission. On the 21st day after admission it suddenly died, it had been crying and a nurse attended to it and in a few minutes returning to it found it dead with a little bloody froth around its mouth and nose, it probably had had a convulsion.

Autopsy the following day showed heart, lungs, liver, kidneys, spleen, tonsils normal. There was no glandular enlargement. The thymus was very large extending down on to the pericardium and weighed slightly over 19 grams. There was no evidence of its having caused any pressure on the trachea. There was a small haemorrhage on one surface of the gland.

1030 Bergen St.

INFANT MORTALITY.*

By St. Geo. T. Grinnan, M. D.,

Richmond, Va.

The object of this paper is to call attention to the large infant mortality which is so significant as to be a subject of discussion in newspaper articles and in the current magazines.

Medical journals all over the world are discussing the question of lowering infant mortality. Various societies both in this country and abroad are discussing plans for the instruction of those having charge of infants. The campaign against infant mortality in Germany has aroused such general interest that on June 4, 1909, an institution for the repression of infant mortality was opened in Charlottersberg, Germany. The German Empress is protectress of this institution. The object of this institution, which has raised $400,000.00, is as follows:

1. The practical and scientific investigation of the question pertaining to the nutrition and care of infants, as well as the care of mothers.

2. The collection of data on infant mortality, and the organizations for the care of infants in the German Empire, and in other civilized countries.

3. To make the results of scientific and practical investigations available to the public by its publications, and to offer information and counsel to officials, and to public and private associations as well as private individuals.

Reduction of infant mortality has not been noted in anything like the ratio that reduction in mortality for other ages has progressed.

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*Read before the Richmond Academy of Medicine and Surgery, Nov. 9, 1909.

During 1907, 351,046 children died during the first year of life in Germany, and two-thirds of these died from disturbance of nutrition. Of every thousand born, one hundred and eighty-five died during the first year of life in Germany.

In England and Wales, the mortality has been in 1890, one hundred and sixty per thousand born.

The report of the special committee on the Prevention of Blindness in the State of New York is as follows: (in part)

"In Chicago in 1904, 86% of all births were reported by midwives. In New York City in 1905, 43,834, or 42% of the whole number of births, were attended by midwives. Of five hundred midwives visited, less than 10% were capable."

These women determine the feeding, and are responsible for much unnecessary weaning. No instruction as to infant feeding or nursing is given. No caution as to the danger of cow's milk in hot weather is given.

Right here it must be said that removal from the breast is done constantly by medical men without adequate investigation. The fact that immunity to disease is greatly enhanced by nursing is not sufficiently recognized.

With the tremendous advance in our knowledge of medicines there should be a marked decrease in infant mortality. The *Monthly Bulletin* of the Health Department of Richmond, Va., shows that infant mortality, under two years of age, due to disturbance of nutrition, increased 10% during the the first six months of 1909, as compared with the first six months of 1908.

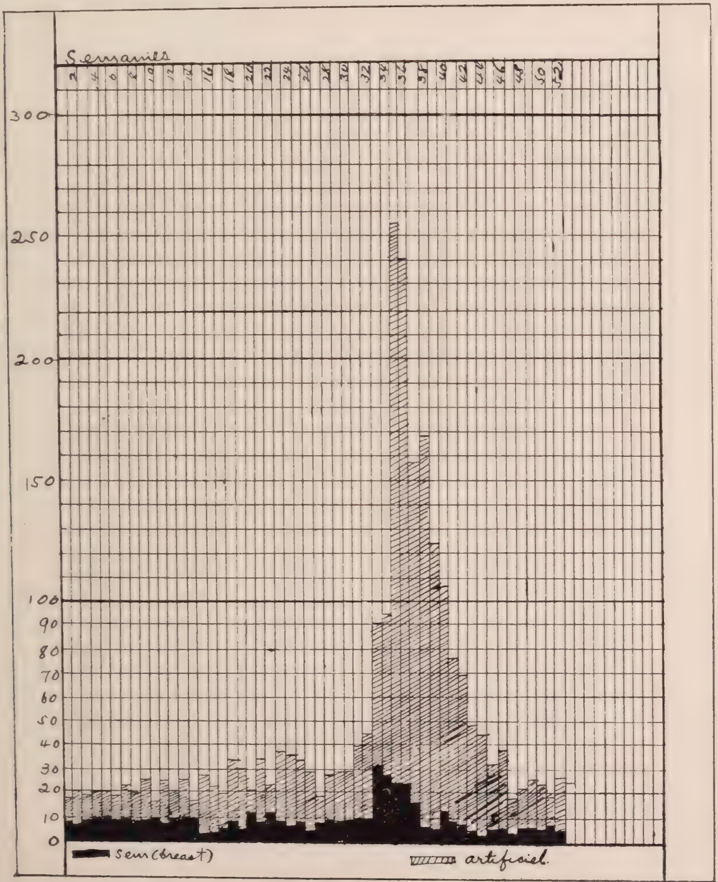
In July, 1909, there were two hundred and twenty-nine deaths in Richmond, Va. Of these, thirty-four, or 15% were due to diarrhoea in infants under two years of age. Twenty-three, or 10% were due to tuberculosis for all ages.

Nine, or 3.9% of the deaths were due to typhoid fever.

In June, 1909, there were two hundred and thirteen deaths in the City of Richmond, of which thirty-nine, or 18% were due to diarrhoea in infants under two years of age. Eighteen, or 8.4% of the deaths were due to tuberculosis for all ages. No deaths from typhoid fever.

It has been estimated that 150,000 deaths result annually in the United States from tuberculosis, and that 300,000 infants perish annually during the first year.

In France, the tragedy is well pictured in the French chart, familiar to every child specialist, called the "Eifel Tower." Here we have a contrast in morbidity between children suckled and those fed upon artificial food. Among the former the ratio of deaths remains comparatively constant until we reach July and August, when it rises to a considerable but not startling



degree, falling shortly afterwards and remaining as at first until the close of the year. With artificially fed infants, however, it is always subject to leaps and bounds. When July is reached the leap is frightful, reaching in France two hundred and fifty-five per thousand born.

Great credit is due Nathan Straus, who seventeen years ago began his campaign against impure milk. Splendid results have been achieved and the milk reform is gradually spreading over the entire country. Pure milk is only one factor. More important than to supply a substitute for breast milk is to encourage breast feeding and render it possible to remove the conditions of under nourishment and employment which prevents women from nursing—and to educate mothers to realize not only the importance of maternal nursing, but also the value of sanitation, infant feeding, infant hygiene and the proper care of their infants and themselves.

Illegitimacy is a factor in high infant mortality. In Glasgow, in 1873, the death rate of legitimate children was one hundred and fifty-four per thousand, against two hundred and ninety-three per thousand for illegitimate children.

We have little idea of the large number of infants "farmed out" to die. Among the negroes, baby farms have done an extensive business here in Richmond.

The death rate of negro children in Washington is seven times that of white children. The white people of the South have sacrificed a large number of their children by turning them over to the ignorant, but kind negro mammy or nurse, who cannot raise her own child.

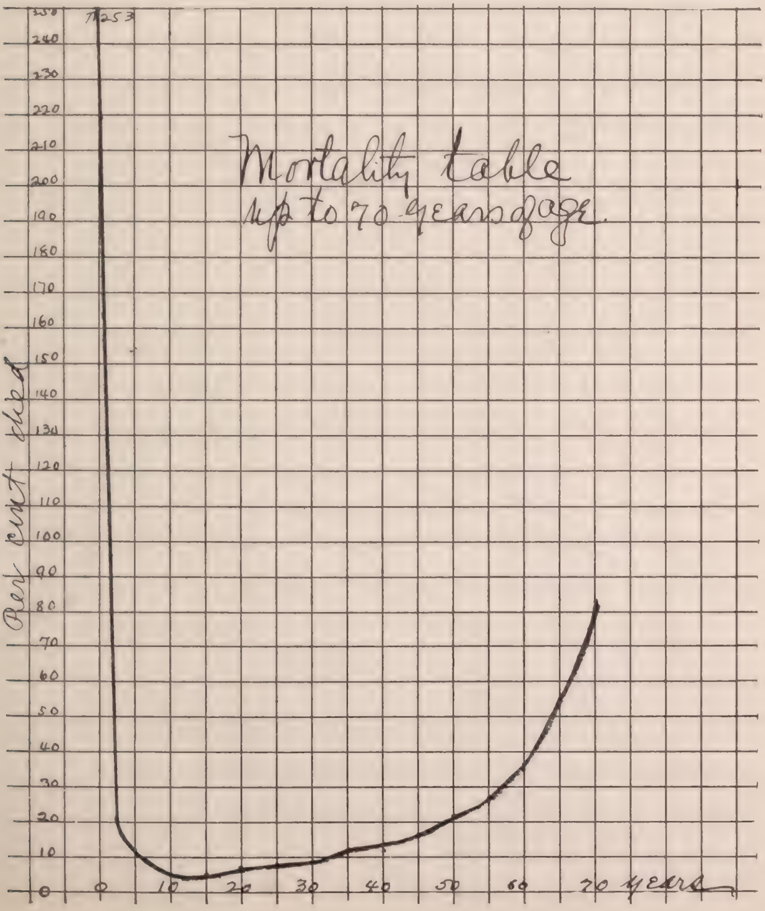
It is important for us to determine what diseases occasion the largest mortality of the first year. Statistics furnished by Professor W. Pransnitz of Gratz are very instructive.

He recorded the causes of death of 1,000 children dying in the first year according to the German statistics for the year of 1900. For every 1,000 births 225 deaths occurred in the first year. Of these 225 deaths, eighty-four or more than one-third were caused by stomach and bowel trouble. Diphtheria, croup, whooping-cough, measles and scarlet fever together account for only one-twentieth of the entire mortality. Tuberculosis, inflammation of the lungs and other inflammatory ailments of the respiratory organs for about one-tenth. Congenital weakness and debility thirty-two, or 14%, other known diseases sixty-eight, or 30%. Unknown eight deaths, or 3%.

Comparing the different races we find the following table:

Death rate under one year per one thousand living.

	1876-1880	1893-1902
England	145	152
France	163	158
Prussia	205	199
Italy	249	173
Switzerland	189	145
United States	166	165.4



A glance at this table shows that the English speaking races have made scant progress with infants under one year.

I wish particularly to emphasize overcrowding as one of the causes of high infant mortality. The following table shows the density of population in England and Wales during 1851 and 1866, both for all ages and for children under five years of age:

Density per sq. mile	166	186	379	1,718	4,499	12,359	65,823
Rate for all ages	16.0	19.1	21.9	24.8	28.0	32.9	38.6
Rate for 5 years	37.8	47.5	63.0	82.1	94.0	111.9	139.5

The mortality in the cities is about double that in the country district, and the above table shows that city life is an important factor in high infant mortality. The number of rooms occupied by the family is a good guide to hygienic conditions, as shown by Dr. W. S. Stowell (*Medical Record,* May 22, 1909). Dr. Neuman in Berlin gathered statistics in regard to room space. He found that out of 2,701 infant deaths 1,792 occurred in one room dwellings; 745 in two rooms, 122 in three rooms and 43 in large dwellings.

The mother who has to go out to work will make a poor nurse. There was a great falling off in infant mortality in England during the American Civil War, from 1861 to 1865. During this time cotton was not shipped from America to England in the usual quantities, and women in England who were forced to do a large portion of factory labor were forced to remain at home. As a result factories in large numbers were closed. Although 24% of the population became objects of charity, the death rate was low.

After the close of the war, the factories were re-opened and the death rates rose to their usual height.

Meinert has gathered statistics to show that it is not solely the excessive temperature or the lack of cubic space per capita in the home that causes the high mortality. A temporary total cessation of spontaneous ventilation in the houses arising from their construction and occurring only under certain barometric conditions constitutes the decisive factor. The number of cases of infant diarrhoea decreased at once with a strong wind and increased rapidly as soon as the wind fell again.

Dr. James Woods, of China told me that he was able to reduce infant mortality 40% by removing a large number of infants to a higher elevation in the surrounding hills, where the air was not so hot and there was more wind.

The influence of prosperity has been studied by Professor W. Pransnitz of Gratz. He studies the influence of prosperity on the mortality of infants dying from ailments of the stomach and bowels. He divided the deaths into four classes: (1) Rich, (2) Middle-class, (3) Poor, (4) Destitute; and the percentage of deaths from these diseases has been calculated for each class. By this means it was shown that in Gratz, for example, in the last fifth of the past century not one child died in a rich family; while in the second class about 4%; in the third class 36%; and in the fourth class 60% fell victims to diseases of the stomach and bowels.

The above statistics prove conclusively that intelligence and proper medical care can easily prevent the high infant mortality which now prevails in all countries. As an economic question it is well to note that the millions of emigrants, the scum of Europe, that have come year by year to this country might have been replaced by people of our own race.

The campaign against infant mortality must be along the lines adopted against tuberculosis. It should be a much discussed subject, and literature on the the subject must be sent to families where births are reported. The midwife must be supplied with the proper literature and she should receive proper instructions herself.

Certainly 50% of the deaths among infants is preventable, and it is within the power of medical men to save something like 100,000 lives in each year.

In 1908, the English Parliament passed a child law for the protection of infants and children. In England no child can be adopted without a permit. In 1909, a bill has been introduced in Congress to form a Federal Children's Bureau to deal with the facts of birth rate, infant mortality, physical degeneration and other juvenile matters. This Bureau bids fair to be of great value to the country.

Sir Thomas Browne must have had in mind infant mortality when he said: "For the world I count it not an Inn, but an Hospital; not a place to live in but to die in."

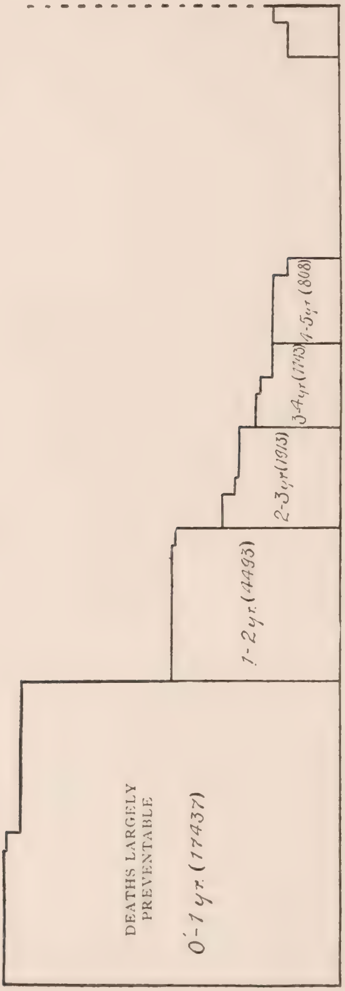


CHART 1.—Mortality in New York City, in 1907, of children under 5 years of age. The total number of deaths in 1907 was 72,205; of those under 5 years, 25,794; over 5 years 46,411. The square at the right represents the average deaths per year of age of all persons over 5 years of age.

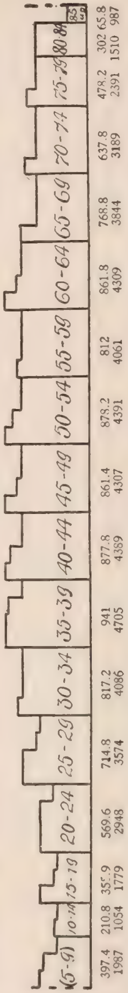


CHART 2.—Average deaths per age for persons of different age groups. The figures in the upper line denote the average deaths per year for each group: those in the lower line denote the total deaths in each group.

We who hold so tenaciously to life, and hold with Socrates that life is worth living, should use our best efforts to protect the lives of helpless infants who have no say as to their fate.

CEREBRAL TUMORS IN CHILDREN.*

By Henry N. Read, M. D.,

Brooklyn, New York City.

Cerebral tumors are by no means rare in children. Before six months of age they are seldom found, but the largest total number of these growths are found during the first decade. Fully fifty per cent of intracranial growths are tubercular and then follow in order of frequency: glioma, sarcoma, cystic tumor, carcinoma, gliosarcoma, angiosarcoma, myxosarcoma, papillary epithelioma, and gumma. This order is taken from Peterson and fairly represents the views of other authors. All authorities that I have consulted, however, give fifty per cent or more of these growths as tubercular. I have seen a number of these cases of brain tumor in pediatric practice, but the most of these have been seen only once and careful observation of them has been impossible. A majority, and perhaps nearly all, of them are relegated to our neurological brethren and are usually placed in their care, but the fact that the larger number of brain tumors occur in young life makes it necessary for the pediatrist to study them carefully. No age is exempt, tumor having been found in an infant of four weeks of age.

Boys are twice as liable to its occurrence as girls and for this no satisfactory reason has been found. Starr in Keating's Encyclopedia gives a table of 236 cases of brain tumor occurring in those under eighteen years of age. Of these 143 were seen in children under ten years of age, 93 cases between ten and eighteen years. The largest number in any one year developed in the fourth year, namely, 22 cases. The next in the second year, 19 cases.

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*Read at the meeting of the Pediatric Section of the Medical Society of the County of Kings, on Nov. 24, 1909.

Tubercular tumors are nearly always secondary to a deposit elsewhere, and this influence of course accounts for this class. Sarcoma and carcinoma too, are generally present somewhere in the body when growths of these are present in the brain. In other words, they are secondary growths. Cysts usually occur as the result of a parasite, the echinococcus or cystocyrcus, or they may follow a hemorrhage into the brain or embolic softening according to Sachs. Gumma in childhood, according to all authors, is very rare. Peterson gives only one case in 355 tabulated by him. Starr states that syphilitic tumor of the brain is exceedingly rare in childhood and "is never the result of inherited syphilis." Sachs, while acknowledging the unquestionable rarity of gumma in the brain of children says that they do occur in hereditary syphilis, and that repeated attacks and relapses suggest the specific character of the disease. The symptoms of brain tumor in children, as in the adult, are generally considered under the head of the general and the local or focal symptoms. Among the first group headache is usually the first and most pronounced symptom. This is generally very severe and constant, though sometimes intermittent. It is worse at night in the syphilitic cases and in the case that I shall show you tonight this was marked. The suffering is intense and the children frequently cry out in agony from it. In those old enough to describe their symptoms the pain is usually given as frontal or occipital, but it has no relation to the location of the growth. It is sometimes dull and continuous with paroxysms of intolerable pain causing the child to scream out. In the case of a fine boy of ten years, son of a dear friend, the child would beg his parents and the doctor to end his sufferings for him. Vomiting is another general sign, is projectile in character and is unaccompanied by nausea. Vertigo, mental hebitude, convulsions and general mal-nutrition are all marked, as well as changes in the mental disposition. Changes in the optic nerve are always to be seen, and vary from simple choked disc to double optic neuritis and atrophy. Syncope and changed pulse rate are present, the pulse having the usual cerebral type, slow and intermittent. Constipation is generally present. Fever is not noticeable as a rule. Local or focal symptoms, as they are called, will depend necessarily upon the location of the tumor to a great extent.

When it is recalled that the cortex of the brain is connected with the subcortical centers by certain tracts, called "projection tracts," through which impulses pass both motor and sensory, it will be seen that there will necessarily be great aberration both of motion and sensation in the patient when these growths impinge upon the tracts or centers. These disturbances are: monoplegia, hemiplegia, unilateral spasms, para- and anesthesia, hemianopsia, aphasia of different kinds. Pressure likewise on the nuclei or course of any of the cranial nerves will cause functional disturbance of the parts supplied by these, which will happen in the event of tumors at the base of the brain or of the axis. The exact location of the tumor, however, is a matter of much difficulty and must be determined by the brain specialist. The surgery of these cases is very unsatisfactory. Although the location of tumor of the brain is difficult the simple diagnosis of the case, that an intracranial growth actually exists, is not difficult and can easily be made by the general practitioner, especially by those familiar with children's diseases.

Treatment.—Without referring to the surgical treatment it may be said that only syphilitic cases, so far as we know, can be cured by medical means, but it is well to remember that all authors agree that some cases not thought to be specific improve by the exhibition of mercury and the iodides, and for this reason all cases not operated on should receive antisyphilitic treatment. The mercury should be given by inunction and should be used freely. Bromides will often help the convulsions especially if they are epileptiform in character. The severe headache will require anodynes, and I generally employ codeia with acetanilid and caffeine. Morphia is dangerous and its administration should be carefully watched. Hot mustard baths and packs are of service and cold compress to the head. The nutrition of the patient of course must be improved by every method at our command. Light nutritious food should be given so as to tax the digestion as little as possible. Milk, eggs, soups, broths, the cereal preparations, and stimulants all have to be used and nutritive enemata must be exhibited when the stomach will not retain food. Constipation is obstinate usually in brain tumors in children and will require active treatment. I usually select calomel in small doses for this purpose, followed by magnesium citrate in solution as the stomach will retain the calomel in small doses when it rejects everything else and injections into the rectum for the purpose of moving the bowels are apt to make the bowel intolerant of nutritive enemata.

As remarked I have seen a number of cases of brain tumor in young children, but have had the care from beginning to end in only five. Four of these died, three coming to autopsy. One was a case of cerebellar glioma in the little boy just mentioned, and was seen by Drs. Starr, McCorkle and Rushmore with me. The other two cases seen with me by the late Drs. William Wallace and Landon Carter Gray were tubercular tumors of the base of the brain and occurred in a boy of four years and a girl about the same age. The fourth case did not come to autopsy and the nature of the growth was undetermined though it was probably tubercular. The fifth case I present to you tonight, and after a lapse of more than a year seems to be entirely well. The history is as follows:

G———. A rather delicate looking boy came under my care in August, 1908, with the following history. Boy thirteen years old; mother died when he was three years old of pulmonary tuberculosis, and he was cared for by his aunt. Mother had four still-born children and gave birth to only one living child, the patient in question. Father's history unknown. Patient has had measles and whooping cough and was a delicate child fr birth. Always had poor digestion and was slow in walking had a peculiar way of balancing himself. At seven years age he had an attack of vomiting, convulsions, headache vertigo, and was sick for three weeks. From that time to present illness there was nothing noticeable about him. He w to school and did very well in his classes, being fond of st and reading. About the first of July, 1908, he complained of headache, had an attack of vomiting, slight convulsions and vertigo. He received treatment and improved, but on July 12th he took to bed with an increase of these symptoms. I saw him first on August 12th. He had then been sick about six weeks, most of the time being spent in bed. On examination he appeared a pale, anaemic looking boy, tall enough for his age but much emaciated. He had a large and bulging forehead, teeth projectile, right eye slightly turned in. He seemed quite apathetic but brightened up when spoken to. Temp. 99°, pulse 56 and intermittent. Complained of headache and more so of vertigo. Unable to stand or walk well. No nausea, but vomited everything that he ate. Bowels very constipated. Urine rather scanty and high colored. Great intolerance of light and sound. Respirations irregular and shallow. Heart, lungs and abdominal organs normal. Reflexes on right side diminished. Koenig's sign noted. Also various anomalies of sensation. Parathesias and also a peculiar trembling of the hands was shown. Right side seems rather weaker than left. Eye examination shows choked discs. Urine negative on chemical examination. A diagnosis of cerebral tumor, probably tubercular, was made and a very grave prognosis given. After three weeks of observation and treatment, during which time no improvement was seen, Dr. Brush saw the case with me, on September 4th, 1908, and confirmed the diagnosis of cerebral tumor. He located the tumor on the left side in the region of the crus and pons Varolii and considered it meningeal and located at the base. Also thought that there might be one large mass or one large and several smaller ones, the situation being as given. I quote from his syllabus of the case, kindly given me.

"Although there might be a gliomatous condition, the chances are largely in favor of its being a tubercular or specific condition. The absence of any other signs of syphilis would point to a tubercular infection, while the family history was divided between the two."

The accuracy of the opinion was soon manifest. Von Pirquet's test for tuberculosis was tried and showed no reaction, and antispecific treatment was vigorously commenced. One ounce of mercurial ointment was well rubbed into the skin every week, rather more than a drachm daily. I had the assistance of an excellent nurse who kept copious notes of the case. An improvement commenced from the first ten days of treatment. The focal symptoms were the first to show improvement and in a month's time the patient sat up all day. The general symptoms were the most obstinate, the headache and vomiting lasting, though in a much lessened degree, for two months, the latter being the last to disappear. The patient was discharged cured, on December 1st, 1908, but was not allowed to go to school until the February term. Since that time he has been in good health, attending school and playing with other boys in a perfectly normal manner.

as congenital stenosis of the larynx. In both cases, (thymic and laryngeal,) there is dyspnoea; also alar respirations, retraction of intercostal spaces, and a peculiar inspiratory sound. In thymic cases there is some difficulty in expiration; in laryngeal cases, expiration is unaffected. The laryngeal stridor is due to malformation or malposition of the epiglottis, so that inspiration narrows the lumen of the larynx. This can be demonstrated at autopsy. Congenital laryngeal stenosis usually gets well. In status lymphaticus we should avoid all excitement and especially operations.

Dr. Kerr said that the first paper and the discussion had emphasized how little we know of status lymphaticus. That and the subject of the second paper were fields for almost unlimited work, both by clinicians and by laboratory men.

Dr. Browning said he thought there had recently been an increase in goitre in Brooklyn and its suburbs. There was a good deal of evidence that, in goitrous districts, affected persons could be cured by boiling their drinking water; this had been shown in the Pruijaub intestinal antiseptics, such as thymol, were also used. As to the diagnosis of thymic enlargement, it can often be palpated in sternal notch; sometimes there are plexuses of veins on the front of the chest, brought out by exercise, such as climbing stairs. A child with enlarged thymus or with adenoids often shows a backward projection of the shoulder blades. Prominence of the mannibrium is also suggestive of enlarged thymus. Cases of drowning, often assigned to "cramps," are frequently cases of thymic death.

Dr. Antonius said exophthalmic goitre seems to run in families.

Dr. J. W. Parrish said he could feel an enlarged thymus sometimes by laying the child on its belly. Examine for it especially when there is a large spleen and general lymphatic enlargement.

Dr. Cross closed the discussion, and said there was certainly a distinct family tendency to goitre.

MEETING HELD NOV. 24, 1909, DR. J. W. PARRISH, CHAIRMAN.

I. Cerebral Tumors in Children.—By Henry N. Read, M. D., published in this issue.

DISCUSSION.

Dr. Brush said that the diagnosis of "cerebral tumor" was fairly easy, but the differentiation of the variety of tumor was usually very difficult. Yet the prognosis and treatment always depends on the variety. In general, the slowly growing tumors are benign, while the rapidly growing growths are malignant. A glioma may be a benign growth, or, on the other hand it may be among the most malignant forms. It is important to remember that the syphilitic growths may declare themselves *suddenly,* after exhibiting no symptoms for a long time. This sudden appearance of symptoms is probably due to the involvement of important blood vessels. Brain tumors often masquerade for a time under various erroneous diagnoses; a common mistake is to call a tumor *epilepsy,* because of the convulsions which accompany the growth. Many cases are also regarded as eye trouble, and are so treated for a longer or shorter period. Still other tumors are called "cerebral hemorrhage." These and other errors are due to careless examination or entire lack of examination. The systematic overhauling of the patient will usually suffice to make the diagnosis of cerebral tumor. The general symptoms of vomiting, headache, etc., are often absent but focal symptoms are always present, and can be found if carefully sought. Probably the most important single symptom is the retinal change; choked disc or even optic atrophy can be readily seen, and some such change in the eye ground is almost constant. The character and extent of convulsions or paralyses are great aids in localizing a growth. Surgery gives some remarkable results in brain tumor of a neoplastic nature, but we should always give a bad prognosis. Operation should only be undertaken after explaining to the patient that it may not help him, and may even make matters worse. Many patients insist on an operation even after being told this, and some apparently hopeless cases improve or even recover after a skilful operation.

Dr. Bartley said that he had not found brain tumors at all common in children, and he was inclined to think that Dr. Read had seen more than his share.

Dr. Ager mentioned the case of a child with convulsions and hemiplegia, both symptoms coming on suddenly. Tubercle bacilli were found in the spinal fluid; autopsy showed a large tubercle on the motor area and a tubercular meningitis. The tubercle must have existed for some time without giving symptoms.

Dr. Parrish said that he had noticed that cerebellar tumors were frequent in children. He asked Dr. Brush why the cerebellum was so frequently affected.

Dr. Brush said that functionally inactive organs were notoriously susceptible to tumors.

Dr. Read closed the discussion by saying that the case presented disproves Starr's statement that gumma of the brain is never the result of *inherited* syphilis. This case was unquestionably one of inherited syphilis of the brain.

NEW JERSEY STATE PEDIATRIC SOCIETY.

The New Jersey State Pediatric Society was organized in Newark on February 3rd, with 34 charter members.

The following officers were elected:

President, Dr. Henry L. Coit, of Newark; Vice-President, Dr. Alexander McAllister, of Camden; Treasurer, Dr. B. Van D. Hedges of Plainfield; Secretary, Dr. Martin J. Synnott of Montclair; Council: to serve five years, Dr. J. Finley Bell of Englewood; to serve four years, Dr. T. N. Gray, East Orange; to serve three years, Dr. B. P. Craig of Jersey City; to serve two years, Dr. Emery Marvel of Atlantic City; to serve one year, Dr. F. H. Glazebrook of Morristown.

The new society is the outcome of an idea formulated several years ago by Dr. Coit, and now successfully inaugurated through the efforts of several of his enthusiastic co-workers.

The objects of the society as outlined in the constitution are:

First: To unite the physicians of the State, who are qualified, for the scientific study of the diseases of infancy and childhood.

Second: To promote by its concerted efforts scientific medical research in the department of pediatrics.

Third: To foster a greater interest in pediatrics among general practitioners.

Fourth: To study the problems of infant mortality and to popularize a knowledge of infant hygiene and of the means for the protection of child life.

The annual meeting will be held in Atlantic City, on the day preceding the convention of the Medical Society of New Jersey, when only members will attend, to hear and discuss instructive and scientific papers, and to transact the routine business of the society. But in order that the society may fulfill

"Pyloric Stenosis of Nursing Infants." Engel (*Deut. Med. Woch.*, 1909), believes the first change, and most important in the genesis of a stenosis of the pylorus to be secretory disturbance of the stomach. This is neither a hyperacidity nor a hyperchlorhydria, but rather a gastrosuccorrhoea. The presence of gastric juice in the empty stomachs of nursing infants is considered abnormal, as this produces a spastic closure of the pylorus. After the acute stage of excessive secretion has passed off a chronic and non-spastic narrowing of the lumen of the pylorus remains. At this time signs of stasis make up the chief part of the clinical picture. The stasis of fat is a sign of retention. The cause of this condition therefore, lies in the extraordinary hyperexcitability of the gastric mucosa. (*American Journal of Medical Sciences*, Feb. 10.)

"Benign Pseudo Trachoma of School Children." Alger, writing in the *Post Graduate Journal*, 1910, doubts the great prevalence of so-called trachoma of school children, and he believes that many of the cases are due to other causes, as the gonococcus, koch-weeks bacillus, or the bacillus of Graefe. The symptoms in the majority of cases are redness and irritability of the eye, with profuse muco-purulent discharge. The conjunctiva of the upper lid is markedly thickened and very red. The eye feels as if it were filled with sand and there is intense photophobia. It runs a course of a week or two, unlike real trachoma, relapses occur year after year and finally there is a scar tissue formation of the lids. This may be considered a spontaneous cure, but not so in all cases. In some there is permanent damage done, with the formation of trichinosis and entropion. Corneal ulcers follow, leaving permanent opacities.

A sharp distinction should be made between papillary trachoma (true) and the follicular type, which later may result from many causes, and is perfectly harmless, and constitutes the great number of cases called trachomas in school. This condition runs a mild course, is characterized by lack of subjective symptoms and pale frogspawn like granules or the conjunctiva, especially in the lower lids and upper fornix. It occasions none of the symptoms of true trachoma and is followed by none of the sequellae. This is nothing more than adenoid enlargement of the glands of the conjunctiva and is due to dirt and dried secretions and it is not contagious.

Treatment. Follicular conjunctivitis needs little treatment save general attention to the health of the child, etc., and internal tonic treatment. The author uses, as local treatment an ointment of copper citrate, and then discusses the expression operation usually done for these cases, stating that permanent scars and adhesions result, leaving deformed eyes, and after all are of no value anyway, and concludes by stating that true trachoma is of rare occurrence.

"The Treatment of Constipation in Children." Dulays treats of this subject (*Edinburgh Medical Journal*, Oct., 1909), stating that "the constipation of adult life owes its origin to the acquirement of the habit in childhood." We should, in treating this condition endeavor to discover whether the seat of the mischief is in the rectum, upper rt of the colon or in the small intestine, whether due to insufficient ion in the intestines and liver or to atony of the intestine. the causes is neglect of attending to the calls of nature. be asked or other means ascertained as to whether there has been a daily movement or not. Even infants can be trained and older children should be "seated" at some stated time of day. Plenty of time should be allowed for this function. A glycerine suppository may aid when nature refuses. Another important factor in causing constipation is the giving of too little fluid. Every child should drink quantities of water every day. Insufficient exercise is another cause. In nursing children the mother's diet should be attended to, as a deficiency of fat and too little sugar will cause constipation in her infant. The mother should take malt liquids. In bottle fed babies, cream should be added, and the milk diluted. A change to raw milk frequently relieves the constipation. Purgatives are bad when given regularly. Phosphates of soda or milk of magnesia are good. Injections are bad when used too frequently. When the stools are gray colored and offensive, Gray powder works well. For older children, in the matter of diet, porridge should be given, also soups, brown bread with butter, bread with milk, green vegetables, fruit, milk and starchy foods. The most useful general drug is Cascara. It is best given in small doses, three times a day.

"Katatonia in Children." In the *Archives for Psychiatrie and Nervous Diseases*, 1909, Ralcke reviews this disease, which he says is characterized by its relation to the evolution of puberty. Kraepelin considers it a syndrome of dementia precox and that it is seen as early as the 14th and even the 12th years of life. Kahlhoun says it may occur at any age. E. Meyer and F. Ziehen have seen it occur even earlier. Infeld associates it with the beginning of sexual activity. The author reviews 10 cases, and shows in them that katanotic symptoms occur in idiots and imbeciles. As a matter of fact katatonia may appear as a symptom-complex of any functional and organic disease. The author concludes by stating that katatonia appears in childhood, usually between the age of 12 and 15 years and that it does not differ from that in adults. Congenital mental insufficiency may be a predisposing element in its production. But there is usually an existing cause.

"Indicanuria in Young Children." Sill in *American Medicine*, Nov., 1909, decries the fact that text books ignore this subject and the author believes tests for indican in the urine are as important as those for albumin, sugar, etc. Indican is present in a large percentage of cases of diphtheria, measles, scarlet, bronchitis, tuberculosis, rheumatism, constipation and gastro-enteritis. The more prominent the toxic symptoms in any disease, the greater the amount of indican found. Sill then describes his test for indican (a color test). Prominent symptoms accompanying indicanuria are foul breath, furred tongue, headache, nervousness, and vomiting, jaundice may also be present. As causes of the condition, the author gives errors in diet and improper oxidation of the food. Treatment—Alimentary elimination by the use of calomel, followed by dilute HCL and nux vomica. Sweets should be prohibited. Cereals, stale bread, orar juice, and fresh vegetables are the foods indicated.

Pertussis. As a very contagious and epidemic disease, whooping cough is often complicated by an inflammatory catarrhal condition of the bronchial tubes. Bronchial catarrh usually is the beginning of the attack; at this time beyond the possibility of contagion or an epidemic, the diagnosis is almost impossible. The disease is usually transmissible at this period and therefore it is extremely difficult to prevent contagion. During the active period, we have the symptomatic tableau, known to all practitioners. The broncho-pulmonary complications are frequent in hospitals. The adenopathic bronchitis may develop after a prolongation of pertussis.

Prognostic.—This disease is fairly benign in the case of children living in the open air, but pertussis is especially serious in the hospitals.

Treatment.—Patient should respire pure air; avoid brusque changes of temperature; at the end of the malady, change of air is very useful.

The alimentation should be light, especially liquid foods, small quantities at a time, frequently administered and given between the attacks of the cough. The attacks necessitate such care as loosening the clothes, holding the head back and toilet of the mouth, nose and throat.

Amongst the therapeutic agents used to relieve the symptoms, we may mention the following:

Antipyrine with Belladonna:—

Antipyrine	2 grams
Syr. Belladonna	30 grams
Water to make 250 c.c.	

For an adult: teaspoonful every hour. For children: dose must vary from .5 grams to 50 centigrams, according to the age up to one year. Antipyrine can also be administered in enema, 50 centigrams per year in the child. The use of this, however, must not be prolonged very long, and the kidneys must be carefully watched.

Bromoform is used according to the formula of Marfan:

Bromoform	7 grams
Sweet oil of almonds	aa 30 grams
Solution gum arabic	
Syr. orange flowers	40 grams
Cherrylaurel water	10 grams
Distilled water to make 500 c.c.	

Mix the bromoform with the oil, agitate, add the rest. A teaspoonful contains four drops of bromoform. It is necessary to begin with very small doses, varying with the age, and to gradually increase up to three times the initial dose, in order to obtain sedative effects during the attack of coughing.

Up to six months	one-half teaspoonful daily
Six months to one year	one teaspoonful daily
One year	one teaspoonful for each year of age

Bromoform is a remedy which produces sleep, irregularity of pulse, and cardiac weakness, and its effects must be carefully watched.

L'alcoolature d'aconit (French Codex) is prescribed in the dose of two drops for each year of age of the child. For adults, not more than thirty drops must be given in the twenty-four hours. Hydrochlorate of heroin may be employed in adults in the dose of .5 to 1 centigram.

Wall and Weill, of Lyon, recommend inhalations of quinoline ten to twenty drops, in 100 grams of boiling water.—(*Union Medicale du Canada*, Nov., 1909).

BOOK REVIEWS.

Short talks with Young Mothers on the Management of Infants and Young Children, by Charles Gilmore Kerley, M. D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital; Attending Physician to the New York Infant Asylum; Assistant Attending Physician to the Babies' Hospital, New York; Consulting Physician, New York Home for Crippled and Destitute Children; Consulting Pediatrist, Greenwich Hospital; Consulting Physician, Savilla Home, N. Y. Second Edition revised and enlarged. Illustrated. G. P. Putnam's Sons, New York and London. The Knickerbocker Press.

Dr. Kerley's aim in the preparation of this book was to present a volume, a study of which would help the young mother to a more intimate and closer acquaintance with, and a more intelligent appreciation of the nature and demands of the life of her offspring. The author has endeavored to answer the many puzzling and perplexing questions which thoughtful young mothers desire information upon and he has very plainly, succinctly and carefully arranged the text so that the mother, in search of information which would best serve her in deciding the all important questions of feeding, clothing, bathing and airing, as well as what to do in an emergency, can find full instruction with ease and dispatch. All of this information is contained in this little volume. A careful reading of the contents would instruct the mother on matters of the greatest importance to her child and enable her to recognize symptoms of illness and appreciate their significance.

The Century of the Child, by Ellen Key. Cr. 8vo, with Frontispiece, cloth bound, 350 pages, net $1.50. G. P. Putnam's Sons, New York, London.

This work has gone through more than 20 German editions, not to speak of its publication in several European countries. Twelve years ago, Ellen Key, the translator severed her connection with the "Champion of Woman's emancipation" and asserted that the salvation of woman depended upon a nobler conception of her natural mission as wife and mother. Since this time, she has largely devoted herself to educational questions and her seriousness and sincerity of ethical purposes have won for her a large and enthusiastic following. It must be admitted that some of her ideas are strongly revolutionary, but in educational questions she shows originality and her writings have had a wide appeal among progressive thinkers. The Chapters upon education are very spirited. Modern schools are severely attacked. She believes and pleads for regular meals, on regular foods, for fixed bed time and play time, etc. She paints in glowing picture the future school and asserts that the kindergarten method of teaching will be abolished and that the child will be an original investigator from its earliest years. It will be seen from a careful study of her book that in the matters of education of children she is a foe of mechanical methods and recommends a large liberty in the bringing up of young people. The book is very interesting especially to those working with or training young children and deals wisely with the all important subject of child living and child training.

PEDIATRICS

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EDITORIAL

THE SCIENTIFIC STUDY OF CHILD EUGENICS.

An innovation that seems destined to have far-reaching and important results is the Department of Scientific "Child Study" now being organized in Clark University of Worcester, Mass. In the opinion of prominent educators nothing so important as this new departure in the study, care and training of children has ever before been essayed. Dr. G. Stanley Hall, President of the University, makes prediction that all of the schools of the country will soon be following the lead of Clark University, and that enormous benefits will be the direct result.

The purpose of this new branch of scientific child study is to minimize to the greatest possible degree the number of the physically and mentally weak, to discover whether some deficiencies are inborn or the result of the improper understanding of child life, why it is that some children are backward, why some play truant, why they do things that they should not and leave undone the things they should: why, in brief, whether the shortcomings of juveniles are inborn faults or the result of environment.

This department will also concern itself with very interesting and intricate problems as to which racial types can best be crossed, and which, intermingling, turns out the weakest and which the more vigorous offspring. It is believed that by a constant observance of all the data that can be obtained, and that by comparison and deduction, many of these now complex problems may eventually be solved. Probably the most practical of all the departments will be that for backward and sub-normal children. Whether the deficiencies are of a slight character or whether there are plain indications or idiocy, each will be studied and the shortcomings remedied as far as they possibly can be, in this department also the child will be taught the most healthful positions in which to study.

Child language, the study of English for very young children, experiments in the best methods of teaching children in public schools, and finally the teaching of common morals and religion will be taken up in other departments.

This direction of attention toward the child is regarded as the most promising sign of the time in child research work. The country recently worked itself into much excitement over the exposure of child labor conditions. There are about half a million children in the United States affected by the child labor law, and though that is a large number, yet it is only about 3 per cent of the total child population of the United States. Thirteen to

15 per cent. of all children who are born in this country die in the first year of infancy, which is a waste of human life several times as serious as the child labor scandal. About one-third of the children who live to enter the elementary grades of schools remain to complete the grammer school course, of these only about one-half enter upon the first year of the high school, and by the beginning of the second year of high school 40 per cent. of this number have deserted.

Of the remainder only one-half graduate from the high schools, some two-thirds of whom are girls. Of the 100 children who begin the race some ninety or more have fallen by the way, either because of ill-health and disease, or because of discouragement through inability to keep the pace or because the school is not so ordered as to fit the needs of the majority. Whatever the cause, it will be the task of the experts at the Child Study Institute to sift them out and to discover the remedies.

FLEXNER'S ANTI-MENINGITIS SERUM.

On March 10th (1908) Dr. Louis Fischer reported before the Section on Pediatrics, New York Academy of Medicine the successful treatment of Cerebro-Spinal Meningitis, with Flexner's Anti-Meningitis Serum, to which we made editorial reference in our January issue, and we are pleased to present to our readers Doctor Fischer's report with the discussions following.

Hitherto this disease has invariably proved fatal in the cases of children under two years of age, and it remained for Doctor Simon Flexner of the Rockefeller Institute of Medical Research to work out and perfect a erum which woud prove a specific for this dreaded scourge. Flexner's Anti-Meningitis Serum marks a distinct epoch in the history of medicine. Its administration by intra-ventricular injection in cerebro-spinal menigitis will minimize the danger of death in infants under two years of age, whereas before its introduction by Flexner the mortality of this disease was 100 per cent. This new treatment for cerebro-spinal meningitis will be hailed with delight by the pediatrician and physician, who have stood helpless by the bedside and watched the idol of a mother's heart succumb to this malady.

Before the discovery of antitoxin, diptheria raged rampant and slayed its thousands, but since the introduction of antitoxin by Behring this dreadful malady has been robbed of its horrors. With the present lights before the profession, what would be thought of a practioner of today who would attempt to treat diptheria without antitoxin? He would be equally culculable who would now attempt to treat cerebro-spinal meningitis without using Flexner's Anti-meningitis Serum.

EXCESSIVE CHILD BEARING AS A FACTOR IN INFANT MORTALITY.

A conference on the prevention of Infant Mortality was recently held at Yale University, under the auspices of the American Academy of Medicine. Among the papers which especially interested us was that of Dr. Alice Hamilton of Chicago, entitled "Excessive Child Bearing as a factor in Infant Mortality." This paper embodied the results of a statistical study of 160 families with regard to the number of children born and the number who died in birth, in infancy or early childhood. The families selected were almost all from the poorer, wage-earning class, the parents being foreign born in all but three per cent. Families with six children were placed in one group those with four were considered in another group, and less than four in another group. The percentage of child mortality in the first group was over two and a half times that in the second group. As the nationality, economic standing, mode of life and knowledge of infant hygiene was the same for the two groups, the explanation of this great mortality in the larger families was probably to be found, Dr. Hamilton said, in the insufficient care given to the over-numerous children, and in the exhaustion of the mothers through excessive child bearing. Grouped according to nationalities, the lowest child death rate was shown in the Jewish families, with the American-born next. The highest death rate was found in the children of Italian parentage, with the Germans, Irish and Slavs ranging in between, in the order named.

Doctor Hamilton believes that insufficient care of children in large families, and the maternal exhaustion resulting from excessive child bearing can be assumed to account for the great mortality of children in large families.

"It is a crime against society, against the state and against the child itself to be brought into a cruel world under such circumstances. Charitable clinics, Christian churches and Emanuel "Movements" can never hope to palliate such a hopeless condition of eugenics."

While we are fixing our attention on preventing infant mortality from the standard of the individual, we must not forget that the important point is from the standard of the race, and the two problems which confront races are population and degeneration. It would not be at all impossible that a country, and large sections of a country, should gradually decline in numbers. In fact, college graduates have shown this tendency already so that the birth rate among the college graduates so far as statistics to the size of families enable us to judge, shows that graduates of Yale, of Wellesley, both male and female colleges, so far as there have been any records throughout the country, are declining. They are not keeping up their end in the population. As if that should extend to the whole population there will be either depopulation or the necessity of improving the death rate, to keep the equilibrium. If it should ever happen that the better class, by which I mean the vitally better class, should refuse to keep up their end in the population, then the worse classes, the criminal and defective classes would multiply, in the haphazard way in which animals and hitherto men have multiplied, there will be inevitable degeneration.

"Under the present social system it would be immoral to counsel the middle or poorer classes regarding the regulation of the size of their families. Those who are sufficiently broad-minded to suggest maritial volition are accused of bad motives. So the divine injunction "to replenish the earth" will go on unchecked and the narrow minded, bigoted pharisees who wear the cloth will continue to justify it, and to heap anathemas upon those, who in the name of reason, and humanity protest against this worthless sacrifice."

,,Among the poor and ignorant fecundity and propogation will continue to have free reign, producing a progeny that will necessarily become more and more degenerate but for the sake of Heaven, for their own salvation and that of their descendants let the great middle class, who are the bulwarks of the social system, see to it that they have no more children than they can properly raise. educate and prepare for the strenuous battle of life."

GONORRHEA AND VULVO-VAGINITIS IN CHILDREN

This has been the subject of much investigation recently; according to Dr. Kimball there exists in infants a remarkable predisposition to infection with the gonococcus, and this is the greater the younger the child. In the newly-born the mother is the usual source of infection, but in older children there is often no obvious source. Amongst 600 admissions to the Babies' Hospital in New York in one year, there were 70 cases of vulvo-vaginitis and 10 cases of arthritis due to the gonococcus, and a large proportion of the vaginitis cases were infected while in the hospital. In spite of careful preventive measures the infection reappeared again and again in the hospital; and it was found that only by complete isolation of infected cases could the spread of the disease be prevented. If such isolation is impossible, it is essential that the napkins from an infected infant should all be sterilized; this measure, however, often failed, and it was found to be safer to use sterilized "opera cloth" which could be destroyed directly after use. Dr. Kimball reports eight cases in which pyemia resulted from gonorrheal infection in infants under the age of three months; seven were males, one was a female. In six of these cases there was a purulent polyarthritis; two cases only one joint, the knee, was involved; in none was there any urethritis or vaginitis; only one showed ophthalmia, and this developed after the joint-affection. A microörganism thought, to be the gonococcus, was isolated from the pus in the joints in each instance. Six of the infants died—

four during the acute stage, two from marasmus after the joint-affection had subsided. Three cases examined post mortem, and all of them showed in addition to the arthritis some broncho-pneumonia. The route of infection in such cases is by no means obvious: it suggested that a gonorrheal stomatitis—a condition of which numerous instances in infants have reported—may be the starting point, and one of Dr. Kimball's cases seemed to support this view. The probability of respiratory infection was also suggested by one case in which infiltration of the trachea was found, and gonococcei were grown on cultures from the mucous membrane.

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ORIGINAL ARTICLES

CEREBRO-SPINAL MENINGITIS IN AN INFANT TWO MONTHS OLD. DIAGNOSIS MADE BY TAPPING THE LATERAL VENTRICLES. TREATMENT BY INTRA VENTRICULAR INJECTIONS OF FLEXNER'S ANTI-MENINGITIS SERUM. RECOVERY.

BY

LOUIS FISCHER, M. D.

Attending Physician to the Children's Wards of the Snydenham Hospital, and to the Riverside and Willard Parker Hospitals, etc., New York.

The success obtained by many clinical observers in the treatment of cerebro-spinal meningitis, by using the sub-dural method of injection is so well known that it hardly needs repitition.

Many papers have appeared both in this country and in Europe attesting to the specific virtues of Flexner's anti-meningitis serum in positive cases when used early in the intraspinal method. The intraventricular method however, has not so far proven successful in the cases reported by Cushing, Netter, and others. I should like to report the following case of an infant, considered hopeless for three weeks, which made a brilliant recovery without any complication, treated by the intraventricular method.

Dora R., two months old, was admitted to the Sydenham Hospital Oct. 2, 1909. The infant was born at full term, normal delivery. No forceps were used. She was breast fed since birth. Until three days before admission to hospital, never was sick. On Sept. 29th, vomiting, anorexia, and gastric discomfort were noted. A laxative relieved these symptoms, but on Oct. 1st, the mother noticed twitching of the arms, stiffening of the muscles of the neck, rolling of the eyeballs, restlessness, insomnia, and sudden piercing cry as though in pain.

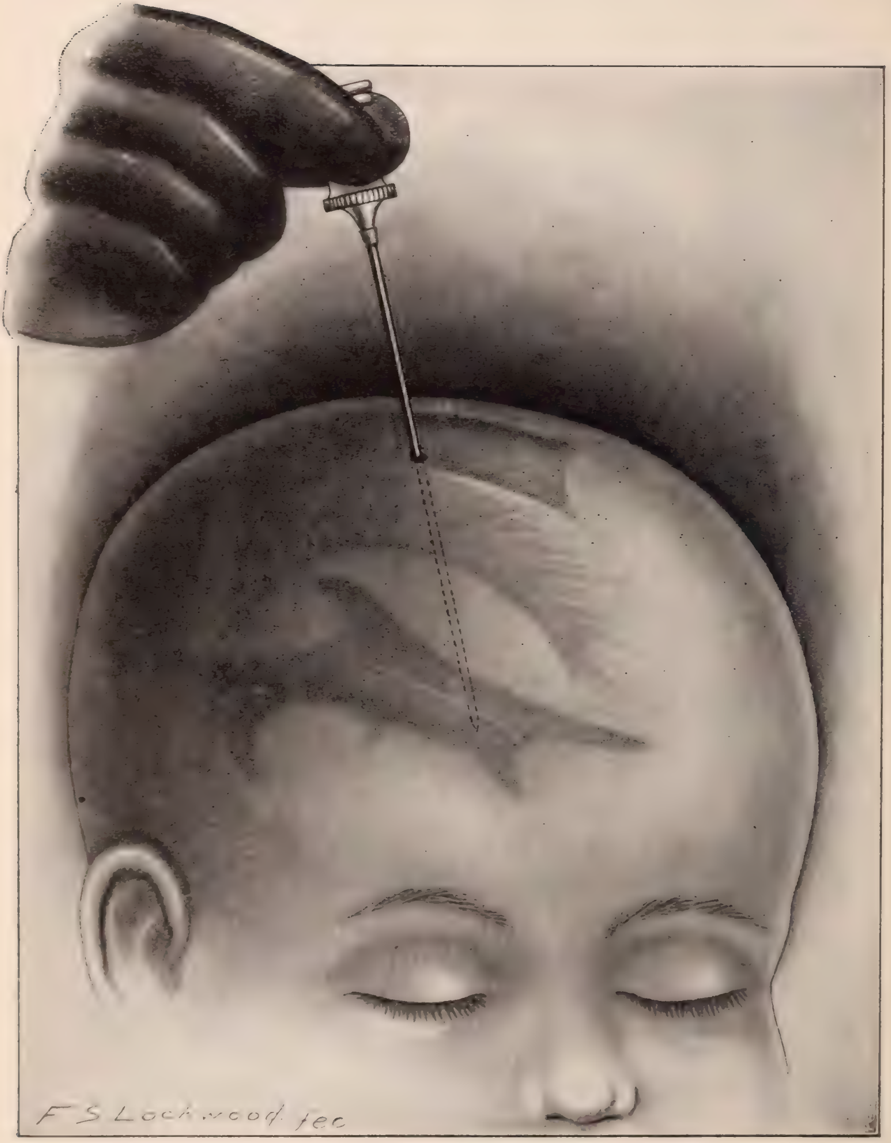
On the following day the infant was admitted to the hospital. There was complete rigidity of the body for ten minutes, then a relaxation. The eyeballs rolled upward, the neck, arms and legs were rigid, and the infant cried. During one of these spasmodic attacks the mouth remained wide open. No cardiac nor pulmonary symptoms were noted.

Chief Complaints

Sudden onset with vomiting. Loss of appetite, in an otherwise normal breast fed infant, with rigidity of head and neck, rigidity of extremities and convulsive movements. Anterior fontanelle open 1-2 inch in diameter, slightly bulging. Posterior fontanelle almost closed. Eyes: pupils equal, and reacted sluggishly to accommodation and to light.

Oct. 2nd a lumbar puncture was performed and I c. c. of turbid blood-tinged fluid withdrawn. The fluid was examined microscopically for meningococcus with negative result.

On Oct. 7th, 10th, and 18th, a lumbar puncture each resulting in dry tap was made. As we had three successive dry taps



Method of Injecting Flexner's Serum Through the Anterior Fontanelle and the symptoms of rigidity, opisthotonus, fever, and twitching were marked, I concluded on Oct. 20th, to tap the child's lateral ventricles. About 15 c. c. of turbid fluid containing pus were withdrawn from the *right lateral ventricle.* Smears made showed intracellular grain negative meningococco. The ventricles were then irrigated with normal saline solution, at a temperature of about 105°F. The excess of fluid was then allowed to drain out through the needle, and 25 c. c. of anti-meningitis serum were slowly injected into the ventricle. During the injection of the serum the child changed in color from a waxy pallor to a uniform red flush all over the body. One-half hour after the injection of the serum, the child still remained flushed, perspired profusely, and had some frothing at the mouth. Otherwise the general condition was very good. The temperature was 101.^{4} respiration, 30; and pulse 120.

Oct. 21st, the ventricles were again irrigated with 40 c. c.of normal saline solution, at body temperature, and 20 c. c. of Flexner serum were injected slowly into the ventricles. The withdrawn fluid contained numerous meningococci.

Oct. 22nd, the child's general condition was very poor. Opisthotonus was marked. The body rigidly bent in the form of a bow. The arms were rigidly extended and the palms everted outward. Occasionally the child flexed the arms and legs at elbow and knee. The child made no sound but laid perfectly quiet although not asleep. When a strong light was held in front of the face, the pupils, which were dilated, contracted quickly. The eyelids also closed downwards when the light was held too near.

Cultures made from this pus at the Rockefeller Institute corroborated our diagnosis.

Perspiration was free, especially on the face. Occasionally frothy fluid or saliva escaped from the mouth.

Upon the slightest disturbance such as a light touch with a pencil, the child went into a spasm of muscular contraction involving all its limbs, later these contractions occurred even without outward irritation every few minutes. The pulse became rapid (about 140) but regular and of good tension, fair size and of good volume.

Oct. 23rd. A lumbar puncture performed in the fourth lumbar interspace resulted in a dry tap. A second needle was then inserted in the third interspace, the first needle being allowed to remain in situ. Through the second needle, 15 c. c. of Flexner serum were injected, about 3 c. c. of which returned out of the first needle. Then 15 c. c. of Flexner serum were injected through the first needle, about 5 c. c. of which returned through the second needle, thus proving that both needles were in the canal and that there was a clear passage from one needle to the other. In all the child retained in its spinal canal 20 to 25 c. c. of Flexner serum.

A better result seemed to be obtained when the disease was attacked by the intra-ventricular injections, and at the same time the serum was injected into the spinal canal. By this means the serum came into direct contact with the affected parts and exerted a marked beneficial effect.

Oct. 25th. Lumbar puncture resulted in 5 c. c. of slightly cloudy, light amber fluid being withdrawn. The fluid looked as though it were colored by the Flexner serum previously injected. Fifteen c. c. serum was then injected into the spinal canal.

Oct. 27th. Twenty c. c. Flexner serum were injected into the ventricles although no ventricular fluid could be withdrawn.

Oct. 28th. Lumbar puncture resulted in dry tap.

Total amount of Flexner serum injected was 100 to 105 c. c.

Oct. 31st. For the past three days the child's temperature has been normal. Its general condition is very good. The pulse is regular, of good quality as to volume, tension and size although slightly more rapid than normal. The child nurses eagerly and retains all its feedings. Opisthotonus still marked and there is some rigidity of arms and hands, but the general hyperesthesia was markedly diminished although still present. Pupillary-light reflex is present and not sluggish. The corneal reflex was present. The Tache cerebrale was present but greatly diminished and does not last as long as when child was first admitted. The Babinsky reflex was present also the Oppenheim reflex. The rigidity of the neck was not so marked, and occasionally the child would move its head to one side. Attimes it would follow a bright object with its eyes. The heart and lungs were negative, as to abnormal physical signs.

Nov. 2nd. There was a slight McEwen present on right convexity.

Nov. 4th. McEwen still present. The opisthotonus and rigidity much less marked when child lies quiet and while nursing. On being handled the opisthotonus became very evident.

Nov. 5th. The child gave evidence of hearing.

Nov. 9th. The fundi of both eyes were examined opthalmoscopically and were found normal in every respect.

Nov. 20th. Lumbar puncture resulted in a dry tap.

Nov. 29th. Lateral ventricles were punctured and 50 c. c. of fluid withdrawn.

Dec. 3rd. The eyes were examined by Dr. Strouse who reported the fundi negative. The infant is gradually regaining its sight.

Dec. 6th. Infant apparently sees perfectly well.

Concerning the method of aspiration or injection of the lateral ventricles, we enter at right angle of anterior fontanelle. The aspirating needle about eight centimetres in length, is introduced downward and toward the median line at an angle of about 20 degrees, to the depth of about 4.5 centimetres. The needle enters the lateral ventricle near the median line, presumably through second frontal convolution.

Harvey Cushing reports a case of an infant six months old (Obstructive Hydrocephalus following cerebro-spinal meningitis with intraventricular injection of anti-meningitis serum (Flexner) Journal of Experimental Medicine, 1908 p. 548), which was sent to the service of Prof. Barker at Johns Hopkins Hospital. In this case a left ventricular puncture was made and 120 cubic centimetres of clear fluid were removed. This fluid proved to contain the Gram negative intracellular diplococcus.

In all five punctures were made, and 560 cubic centimetres of fluid withdrawn, and 60 cubic centimetres of Flexner antimeningitis serum were injected in four injections of 15 cubic centimetres each.

At the Johns Hopkins Hospital several patients were subjected to lumbar laminectomy and a permanent drain was established after washing the subarachnoid space as thoroughly as possible by retrograde irrigation.

When a stasis of ventricular fluid exists, or as in my case, a purulent fluid containing the meningococcus is walled in and we cannot drain the ventricles by means of a lumbar puncture, then the only conceivable plan is to resort o tapping by means of an aspirating needle, washing the ventricles by means of a harmless saline solution, and lastly injecting the anti-meningitis serum as a specific, and to modify toxaemia if present. It would seem from a careful study of my case that there was no danger incurred by piercing the frontal lobe and entering the left or right ventricle, but rather relief given to such symptoms of intracranial pressure due to the presence of the liquid confined within the skull. Such pressure symptoms consisted of rigidity, spasms, and continued opisthotonus.

To avoid intracranial pressure Flexner has warned against the injection of more fluid, i.e. serum, than has been removed.

Summing up the treatment of cerebro-spinal meningitis resolves itself into the following proceedure: First, lumbar puncture should be performed as soon as distinct meningeal symptoms are noted. Concerning the color of the spinal fluid, competent observers agree that it is usual for turbid fluid to be found consisting of many pus cells containing the meningococcus. There are very many cases however, where early in the disease, the fluid is almost clear microscopically, and still the meningococcus was found in the centrifuged specimen, and by culture identified as the meningococcus intracellularis. In cases of this kind, the larger the quantity of spinal fluid that can be drained away, the better for the patient. The usual quantity drained is 25-30 cubic centimetres, although I have frequently removed 50-60 cubic centimetres at one spinal puncture. Our next step is to inject the Flexner serum. *If possible the quantity of serum should equal but never exceed the quantity drained from the spine.*

On the other hand if the lumbar puncture yields a dry tap and meningeal symptoms continue, with rigidity and opisthotonus, then I certainly should suggest aspirating the lateral ventricles if in an infant; through the anterior fontanelle, and if in an older child, by the method known as the Kocher method, entering the skull by means of an incision, and then injecting the anti-meningitis serum directly into the ventricle.

A small patch of scalp is shaved and a short one inch linear incision made about 3.5 centimetres from the anti-longitudinal line and about 5 centimetres anterior to the Sulcus centralis; the bone is exposed and penetrated by a Doyen perforator followed by a burr, which leaves a cup shaped fossa and gives sufficient exposure to the dura to assure the operator that there is no large underlying cortical vessel. The hollow exploratory needle which should have a blunted point with openings upon the side, is then gently inserted into the second frontal convolution perpendicular to its surface, and at a depth of from 4 to 5 centimetres readily finds the ventricle, perpendicularly if it is distended.

(Cf. chapter in Keen's "System of Surgery," 1908, Vol. III page 117.)

If pus is present then the ventricles should be drained and washed with a normal saline solution until the fluid returns clear. Our next step is to inject no more than 20-25 cubic centimetres of anti-meningitis serum. This proceedure should be repeated daily until tapping of the ventricles yields a negative result.

If symptoms of intracranial pressure are noted immediately after the injection, and vomiting or convulsions appear then it is better to postpone the aspiration and washing of the ventricles, plus injection of serum, to once in 48 or 72 hours, instead of daily. The symptoms of the patient and his individual condition must be studied and compared with the condition prior to such treatment, and this will be the safer guide as to the propriety of a second or third or fourth intra-ventricular injection than can be laid down in a positive rule.

Measurements of Head.

Oct. 27th,	Occipito-frontal	14.5 inches
	Occipito-mental	16.5 inches
	Suboccipito-frontal	15 inches
	Suboccipito-bregmatic	12 inches
Oct. 30th.	Measurements the same.	
Nov. 20th.	Occipito-frontal	15.25 inches
	Occipito-mental	16.5 inches
	Suboccipito-bregmatic	14.25 inches
Nov. 22nd.	Occipito-frontal	15.25 inches
Nov. 26th.	Occipito-frontal	15.60 inches
Nov. 29th.	Occipito-frontal	15.75 inches

Dec. 3rd.	Occipito-frontal	15.75 inches
Dec. 9th.	Occipito-frontal	15.75 inches

Anti-meningitis Serum Injected and Fluid Aspirated.

Sixty-five cubic centimetres of serum were used in three intra-ventricular injections. Seventy cubic centimetres of fluid were aspirated during three intra-ventricular punctures. A fourth intra-ventricular puncture yielded a dry tap.

Nov. 22nd. The lateral ventricles were punctured and fifty cubic centimetres of fluid aspirated under pressure. The first test tube showed a clear fluid, the second a slightly turbid fluid, the third a clear fluid, and the fourth a clear fluid.

Lumbar Puncture.

Thirty-seven cubic centimetres were injected in two sittings by the intra-spinal route. Six lumbar punctures resulted in dry tap. In two lumbar punctures we aspirated a total of six cubic centimetres of fluid resembling the serum injected, in which the meningococcus was absent.

Success in my case was due to persistence in the method outlined, by removing a sufficient quantity of the purulent exudate within the brain, then injecting the serum.

The value of nutrition must not be forgotten. This infant was nursed at the human breast, which in itself gave sufficient strength to aid in establishing normal conditions. It is important to supervise the function of the bowel, hence, an enema or an occasional dose of castor oil was ordered. Likewise the function of the kidneys was aided by giving water to aid diuresis.

The infant entered the hospital Oct. 2nd, and was discharged Dec. 16th, in normal condition. The eyes have been examined by Dr. Alfred Strouse and by Dr. Chas. May. Both reports show no evidence of blindness. There is no blindness or deafness. The progress of the infant has been quite good. Two teeth appeared during the seventh month. The infant tries to sit up, nurses well, sleeps well, and is to all appearances a normal infant.

I am indebted to my House Staff, Drs. Bobrow, Clurman, Littenberg, and Freund, without whose valuable assistance this case would not have recovered.

162 West 87th Street.

HEREDITARY ATAXIA.

With Report of Three Cases.

BY

ST. GEORGE T. GRANNAN. M. D.
Lecturer on Diseases of Children, Medical College of Virginia, Richmond, Va.

In 1861 Friedrich described an ataxic paraplegia, which is hereditary. The disease occurs in members of the same family, and the onset begins in childhood. Either the males or the females of the family are usually attacked. The disease invariably limits itself to either of the two sexes. The disease may in some cases be traced to a grandparent, some uncle or aunt or other relative. Direct inheritance is rare. In some cases there has been a history of other neurotic diseases, such as insanity or epilepsy in collaterals or ancestors. Hereditary or Friedrich's ataxia depends on combined posterior and lateral sclerosis with changes in the cerebellum.

In regard to the patellar reflexes some peculiar conditions exist. There are spinal forms with exaggerated reflexes and cerebellar forms with diminished reflexes. Reflexes usually disappear early in Friedrich's babes. Reflexes may differ in the two legs. Among other symptoms are found nystagmus, pes equinus, uncertain gait, walking with the legs wide apart. In cerebellar cases, reeling like a drunken man is a usual symptom. The disturbance of coördination effects not only the walking, but the standing and sitting posture as well—a constant search for support. Romberg's symptom is less marked in the spinal than in the cerebellar form. Wobbling head and hand remor are quite constant in the spinal form.

In the spinal form some observers give from four to seven years as the time of onset. One author, Vizioyes, noted that thirty-nine out of sixty cases began during the first year of life. In the spinal form scoliosis or kyphoscoliosis is not uncommon and is due to weak muscles. Muscle sense is intact. There is not the spontaneous lancing pain of ataxicparaplegia. The cutaneous reflexes are preserved. There may be paralysis of the rectum and bladder late in the disease. There is disturbance of the ocular muscles; strabismus, ptosis and diplopia, as seen, especially in Marie's form. Disturbance of speech is regularly present. The intellect is impaired. The course of the disease is slow, and it may be years before the patient is confined to the bed.

Schultze in post mortem found changes in the posterior columns of the spinal cord. The spinal cord was diminished in size as a whole. He found degeneration of the pyramidal tracts and changes in the cerebellum. Other writers report on autopsy sclerosis of the posterior columns of Goll in their entire extent and the columns of Burdach in varying degrees of intensity and extent. Disease of the posterior roots was noted. Other portions of the spinal cord are affected, the lateral cerebellar tract, the columns of Clarke and Gowers bundles are usually affected. Marie has given us a description of a morbid condition, which, though resembling Friedrich's ataxia, has other peculiar features which he regards as a distinct entity. The picture given by Marie differs by a later onset (twenty years of age,) greater uncertainty of gait, tendon reflexes greater or exaggerated and occasional atrophy of the ocular nerve.

Post mortem there is hypoplasia of the cerebellum with secondary degeneration. Marie calls this heredo ataxia cerebelleuse. Numerous reports have confirmed Marie's opinion. Most authors, however, believe that Friedrich's ataxia and heredo ataxia cerebelleuse, cannot be distinguished.

In typical cases of heredo ataxia cerebelleuse, marked atrophy of the cerebellum as a whole and of its cellular and nervous elements is noted, and degeneration of the tracts derived from the cerebellum are found.

Various theories have been advanced to explain the cause of the disease, but no definite cause has been found. It is probable that the disease is a result of defective development of various parts and systems of the spinal cord or cerebellum or both. The disease is restricted to the posterior and lateral columns.

Hoffman has described an hereditary form of progressive muscular atrophy of spinal origin in which the chief defect was found in the anterior gray matter of the cord. Hereditary spastic paralysis is another disease which belongs to the hereditary diseases of the spinal cord.

In the three cases here reported, I am unable to assign any cause for the disease. The three cases are three sisters. The mother's parents and grandparents lived to a good age with no neurotic disease. The mother is alive and in good health. The father's parents and grandparents gave no history of any nervous disorder of any kind. The father is healthy and has never had syphilis. The three cases agree with the cases reported by Gowers in that no immediate hereditary causes can be traced. Yet, the three cases are sisters, which points strongly to heredity. There is no history of chorea or other neurosis in the parents or in the children before the appearance of the disease. There is no history of alcoholism in the parents. No history of any children born dead.

Case One: Female: one of six children; second child; eight years old when the disease appeared. Previous to the onset of the disease, the child was apparently healthy. Early past history as follows: Marasmus when a baby, later pneumonia, scarlet fever, measles, pertussis and chicken pox. These diseases seem to have been successfully passed before the paraplegia began. The first symptoms noticed were gradual impairment of coördination; first in the legs and afterwards in the arms. Initial pains occurred at times, but there was no lightning pain such as occurs in ataxicparaplegia. The movements of the head and neck were jerky and irregular. Tremor was present, the hands and head and tongue being affected. The patient reeled like an alcoholic. The child walked with legs apart, having a combined ataxia and cerebellae gait. As the disease progressed, the patient would stumble or fall easily when walking, the head oscillating as in sclerosis or degeneration. Speech was impaired so that it was difficult to understand what was said. Nystagmus was present. No loss of light reflex. The Argyll Robertson pupil was absent. Sensation was not interfered with. No anaesthesia in the legs. Muscular power was weak. Superficial reflexes preserved, deep reflexes absent. Knee jerk gradually passed. Electrical reaction (faradic current) of all nerves and muscles of arms are impaired. The patient appeared more idiotic than she was. There was a marked degree of emaciation, the face having a drawn and old appearance.

Case Two: Female; sister of Case One. Disease developed at age of four years. Previous to the onset of the disease the child had twenty small abscesses about the head and neck. No history of any infectious disease of childhood, whatever. Onset the same as in Case One. Reeling gait very marked. Mental condition impaired, but not so impaired as appeared.

As is seen, this child developed the disease at a much earlier age than her older sister. The child is now eight years old, and the disease is slowly progressing. She cannot walk. Her condition is pitiful in the extreme.

Case Three: Sister of Case One and Case Two. Youngest child. The very remarkable feature of this case is that the disease began to appear when the infant was only eighteen months old and gives no history whatever of any disease prior to the onset of the hereditary ataxia. The disease was manifested by irregular jerky movements of the head, impairment of speech, muscular weakness, nystagmus, inability to walk, inability to stand and absence of knee jerks. She died at the age of three years. It is interesting to note that the disease began on the older sister at eight years, in the next sister at four years, and in the next at eighteen months of age.

One brother died of diptheria but did not develop the disease. One brother is alive now, aged sixteen, has been always healthy and presents no sign of the disease.

Treatment has had little effect on the course of the disease.

SCARLET FEVER PROPHYLAXIS WITH STREPTOCOCCUS VACCINE.

BY

RICHARD M. SMITH, M. D.
Boston, Mass.

There has been considerable work done in Russia on the immunization of patients against scarlet fever by the use of streptoccus vaccine, but thus far little or no attention has been paid to the subject in this country. Whether it is believed that the streptococcus is the real cause of the disease or not, the use of the vaccines provided the results are satisfactory may still be continued. The work was first undertaken, by and has largely spread through the influence af Gahitschewsky.

He used a concentrated bouillon culture of the streptococcus isolated from a person ill with scarlet fever killed by heating to 40°B with the addition of 0.5% carbolic acid. The dose was O. 3 c. cm. in children two to ten years old—modified from this according to age. The contra-indications for use are nephritis very young or greatly exhausted individuals and possibly high temperature. It is claimed that after three doses of the vaccine, given at seven to ten day intervals, a complete immunity against scarlet fever is established. The duration of this immunity is of course a matter of speculation but is believed to remain at least one and a half years. In the majority of cases there is some local reaction at the site of innoculation consisting of a small area of redness and infiltration with some pain and tenderness lasting one to three days. There is usually also a little rise in temperature, some headache, and general malaise. In from 10% to 15% of the cases, twenty-four hours after the injection, there appears on the chest and abdomen a puncture erythema very much like the eruption of scarlet fever but not followed by any desquamation. This eruption lasts one to three days and may be accompanied by sore throat, some swelling of the lymph glands and often the so called strawberry tongue. After the first injection the reactions are very slight if any.

Guiernoff reports its use in a small village where no quarantine precautions were observed. There were thirty-four unvaccinated children of whom twenty-four or 70% had scarlet fever. There were forty-eight vaccinated children of whom four or 8. 3% had scarlet fever and these four came down too soon after the injection for immunity to have been established. In another village there were forty-five uninoculated of whom six or 13. 3% had scarlet fever; there were 56 inoculated of whom one or 1.77% had scarlet fever. Altogether, he vaccinated 455 cases, only seven of whom had the disease. In villages where there was no vaccination 20% of the children contracted the disease, 11.1% of these died, while in the villages with vaccination, only 3.7% had scarlet fever and there were no deaths.

Yemelyanoff worked in the midst of a severe epidemic and none of the 610 cases vaccinated contracted the disease. This is particularly significant because nearly every house in the district was infected and there was no quarantine.

Zelikin used vaccine in a country district where there was a severe epidemic and of 613 cases vaccinated, only four had scarlet fever, and all these had had but one inoculation.

Nikitin vaccinated 528 children of whom eight had scarlet fever and all of these had had but one injection. In the villages not vaccinated 16% of the children had the disease.

Many other similar results may be cited; in all over fifty thousand vaccinations have been made. From these accounts it would seem that:

(1) Streptococcus vaccine has some influence in controlling epidemics of scarlet fever.

(2) Their use, with proper care, is attended by no harmful results.

(3) They should be given wider application in this country to prove or disprove the contention of the Russian physicians.

The quality of the vaccine used is believed by most men to have no influence in the severity of the reactions, but Smirnoff, who had unusually few reactions in this series of cases, says it was because he used smaller doses.

A few cases give no reactions, local or general. In this class are those who have had scarlet fever previously, and those who, as we say in smallpox vaccination, "didn't take."

The only really bad case of which any report could be found, and over 50,000 vaccinations have been made, was of a child two and a half years old who had a severe nephritis and died on the thrid day after injection. Zelikin, who reported the case, thinks the injection was given to this child when she was already in the incubation stage of scarlet fever, though many other men have given the vaccine at this time and do not think any harm is done.

JAUNDICE IN THE NEWBORN. SOME ILLUSTRATIVE CASES.

BY

JOHN LOVETT MORSE, A. M., M. D.

Assistant Professor of Pediatrics, Harvard Medical School; Associate Physician at the Children's Hospital and at the Infant's Hospital, Boston.

Jaundice in the new-born, although in the vast majority of cases merely a manifestation of the condition known as icterus neonatorum, may be due to a variety of causes, some of them very serious. Knopfelmacher's explanation of the origin of icterus neonatorum is the most satisfactory. No treatment is indicated. Septic infection of the new-born is far more common than is generally believed. Jaundice is a not uncommon symptom. No justification for setting apart the cases with jaundice and cyanosis under especial names, such as Wicnkel's or Buhl's disease. Diagnosis from icterus neonatorum made principally on general condition, temperature and presence of bile in the urine. Jaundice from congenital obstruction and obliteration of the bile ducts is also rather more common than is usually supposed. In this condition the stools are white or gray at birth or as soon as the meconium has been passed and do not contain bile. The urine does contain bile. "Catarrhal" jaundice is very unusual at this age, but sometimes occurs. Diagnosis from congenital obliteration of the bile ducts is often hard but can be made on the absence of enlargement of the liver and spleen. Jaundice sometimes occurs in connection with a syphilitic interstitial hepatitis. In this condition the liver and spleen are both much enlarged and other evidences of syphilis are almost invariably present. The so-called congenital icterus, in which babies are born jaundiced and remain jaundiced throughout life, the jaundice and its cause having little or no effect on the general condition or the expectancy of life, is very uncommon, only fourteen cases having been reported. The etiology is very obscure. Diagnosis cannot be made in the first few weeks. Jaundice also occasionally occurs in the new-born which cannot be explained by any of the conditions mentioned, and which in some cases is not satisfactorily explained even after the postmortem examination.

Illustrative cases of these conditions were presented.

THE SCIENTIFIC BASIS OF LACTIC FERMENT THERAPY.

Translated from the Revue de Pharmacalogic Medicale, Paris, Feb. 1910.

BY

FREDERICK S. MASON, M. D.

New York City.

Medication by lactic ferments, while first received with some misgivings, grows daily in importance. Drs. Rosenthal and Chazarain have now established a scientific basis for this form of treatment. In their investigations these authorities used pure cultures of the streptococcus or the streptobacillus lebinis, (two of the Bulgarian organisms of sour milk), and cultivated them in conjunction with organisms recognized as pathogenic.

The staphylococcus and enterococcus of Thiercelin flourish in milk, which is therefore well indicated as a culture medium, since lactic ferments grow equally well in it. The controle of the vitality of these micro-organisms was made with bouillon and on inclined gelose, both of which are favorable mediums for the enterococcus and staphylococcus but absolutely hostile to the development of lactic ferments.

The Following Results were Obtained:

(A) The staphylococcus and lactic ferments were cultivated together in skimmed milk.

1-O A six day skimmed milk pure culture of the staphylococcus and a six day pure culture in skimmed milk of the Bulgarian bacillus, which had been previously controlled for purity with gelose were used.

I. Simultaneous culture. The 2nd of June, 1909, an öse of the Bulgarian ferment and an öse of the stayphylococcus of

Thiercelin were cultivated together in a tube with skimmed milk (f. s.).

On the 3rd, the contents of the tube f. s. were coagulated. Inoculation on the 3rd on gelose gave on the 4th an abundant culture of the staphylococcus. The tube f. s. inoculated on gelose the 4th gave rare colonies in 24 hours.

On the 5th, the same tube (f. s.) gave no signs of staphylococcus on gelose.

(b) On the 2nd of June an öse of the lactic ferment and a c. c. of the staphylococcus were placed together in a tube of skimmed milk (f. s.)

On the 3rd, the milk (f. s.) was coagulated and gelose inoculated, which gave on the 4th a culture of the staphylococcus.

On the 4th, the milk (f. s.) inoculated on gelose gave no staphylococcus.

(c) On the 2nd of June, 1c. c. of lactic ferment and an öse of the staphylococcus were cultivated together in a tube of skimmed milk (f. s.). On the 3rd the milk (f. s.) was coagulated. Inoculated on gelose, it gave on the 4th, a pure culture of the staphylococcus. On the 4th, the tube (f. s.) inoculated on gelose gave no staphylococcus.

II. An öse of staphylococcus was cultivated with milk in a tube with the lactic ferment (six days' milk culture). This was done on the 2nd of June. The 3rd it was inoculated in gelose and remained negative for staphylococcus.

(b) An öse of six day milk culture of Bulgarian bacillus in a tube of staphylococcus, (six day milk culture). This was done on the 2nd of June; on the 3rd, it was used to inoculate gelose; on the 4th, it gave only a poor culture of the staphylococcus; on the 4th, a second inoculation on gelose was made which gave on the 5th a single colony of staphylococcus. On the 5th, the experiment was repeated on gelose with no result.

2-O Culture employed, staphylococcus in skimmed milk, culture being 24 hours old, milk not coagulated and lactic ferment in skimmed milk four days old.

I. Simultaneous culture. An öse of the Bulgarian ferment and an öse of staphylococcus were cultivated together the 2nd of June in a tube of skimmed milk (f. s. bis)

The 3rd, the tube (f. s bis) was coagulated. Inoculated into gelose, it gave on the 4th colonies of the staphylococcus. The 4th, the tube (f.. s. bis) reinoculated into gelose gave no staphylococcus.

(d) On the 2nd of June, an öse of lactic ferment and a c. c. of the staphylococcus were cultivated together in a tube of skimmed milk (f. s. bis).

The 3rd, the tube (f. s. bis) was coagulated. Inoculated into gelose, it gave on the 4th an abundant culture of staphylococcus. On the 4th, the tube (f. s. bis) was inoculated into gelose and gave on the 5th, five small colonies of staphylococcus. The 5th, the tube (f. s. bis) was reinoculated into gelose without result.

(c) On the 2nd of June, a c. c, of the Bulgarian ferment and an öse of the *staphylococcus* were sown together in a tube of skimmed milk (f. s. bis). The 3rd, the tube (f. s. bis) was coagulated. Inoculated into gelose, it gave on the 4th colonies of *staphylococcus*. The 4th, the tube (f. s. bis) was used to reinoculate gelose and gave no positive result.

II. The 2nd of June an öse of 24 hours skimmed milk culture of *staphylococcus* was cultivated in presence of a four day culture, of the Bulgarian ferment. The 3rd, it was used to inoculate gelose and gave negative results.

(b) The 2nd of June an öse of the lactic ferment (four days' milk culture) was sown in a tube with the 24 hours' culture of *staphylococcus*. The 3rd, the milk was coagulated. Inoculated into gelose, it gave on the 4th, a culture of the *staphylococcus*. Reinoculated into gelose the 4th, it gave on the 5th a culture of *staphylococcus* On the 5th, reinoculated into gelose, it gave negative results.

Conclusions.

1-O In using a six days old *staphylococcus* culture, having coagulated milk, the following results were obtained:

By inoculating a tube of sterile milk with an öse of each organism, the *staphylococcus* died in three days.

With an öse of the Bulgarian ferment and an öse of the *staphylococcus*, culture, the latter died in two days.

With a c.c. of the Bulgarian ferment and an öse of the *staphylococcus*, the latter died in two days.

If the lactic ferment is introduced into a *staphylococcus* culture, the latter is killed in three days. Inversely, if the culture of the *staphylococcus* is introduced into the Bulgarian ferment the *staphylococcus* does not grow at all.

2-0 In using a 24 hours' *staphylococcus* culture, the milk not yet being coagulated, the following results were obtained:

In inoculating in a tube of milk with öse one of each micro-organism, the *staphylococcus* is killed in two days. With an öse of the Bulgarian ferment and a c. c. of the *staphylococcus*, the latter dies in three days. With a c. d. of the Bulgarian ferment and one öse of the *staphylococcus*, the latter dies in two days.

If the lactic ferment is used to inoculate the *staphylococcus* culture, the latter dies in three days. If the *staphylococcus* is introduced into the Bulgarian culture it does not develop at all.

It should be carefully noted that curdled milk cannot be contaminated by the *staphylococcus aurim* as it is by all the micro-organisms of the Eberth coli group.

Identical experiments have been made with the enterococcus and the Bulgarian bacillus (streptobacillus lebinis) and the conclusions arrived at by Rosenthal and Chazarain are very nearly similar to the preceding.

1-0 Using a 48 hours' enterococcus culture and coagulated milk, with the addition of a lactic ferment culture of the same age, results were as follows:

By inoculating a tube of sterile milk with an öse of each micro-organism, the vitality of the enterococcus was impaired by the second day but on the third, it was dead.

With an öse of the Bulgarian ferment and 1 c. c. of the enterococcus, the latter died in three days, but even on the second day its vitality was lessened. With a c. c. of Bulgarian ferment and an öse of the enterococcus culture, the latter died within two days.

If the lactic ferment is sown in a tube of enterococcus culture, the latter is killed in four days, but its vitality diminishes on the third.

Inversely, if the inoculation of the enterococcus is made with the lactic ferment, the enterococcus does not develop at all.

2-0 Using an enterococcus culture, 48 hours old, and coagulated mild, by addition of a Bulgarian culture of the same age, the following results were obtained:

Inoculation of a tube of milk with an öse of each culture, killed the enterococcus in two days. It was the same when an öse of the Bulgarian culture was added to ac. c. of the enterococcus, as well as when a c. c. of the lactic ferment was added to an öse of the enterococcus culture.

Therefore, if the Bulgarian culture was inoculated into the enterococcus culture, the latter died in three days and its vitality was impaired from the second day. Inversely, if the inoculation of the enterococcus was made, into the lactic ferment, the enterococcus did not grow.

The principle already established by previous communications is that coagulated milk is not contaminated by the Eberth Coli group, is verified with the staphylococcus aurim and also applicable to the enterococcus of Thiercelin.

While it may be objected that these experiments are theoretical grounds only for therapeutic treatment with lactic ferments, it is permissable to believe that the good results of lactic ferment therapy in divers forms of enteritis, whether caused by the colon bacillus, the bacillus of Eberth, the staphylococcus, the enterococcus etc., may be the direct result derived from the interference with their growth brought about by such special forms of the Bulgarian lactic ferments, streptobacillus and streptococcus lebinis, found in the commercial ferment known as fermenlactyl.

The close relationship of the enterococcus with the pneumonococcus and streptoboccus suggests the use of this ferment in intestinal streptococcic infection.

The practical application of these ferments now is recognized by surgeons as a prophylactic measure prior to abdominal operations. In obese subjects the exclusive fruit and vegetable diet recommended by Pauchet of Amiens should be followed up for some weeks or months in order to bring about a reduction in weight. Irreducible hernias become much more easily operable after a reduction of from 10 to 30 kilos.

Pauchet says that distention of the intestine by gas interferes with the operator and makes the patient suffer after the operation. This fermentation can be easily prevented by the use of fermenlactyl, pure cultures of the Bulgarian ferments, (*streptobarillus and streptococcus ebinis*,) which are conveniently administered in the form of 30 centigram tablets or in the rich cultures of buttermilk made with these tablets.

MEASLES.

BY

GEORGE L. SERVOSS, M. D.

Fairview, Nevada.

The present reports show that this disease is very prevalent all over the country. It is a disease more infectious than scarlatina and liable to recur, even second and third attacks not being rare, and it is no respecter of age, those who have missed it during childhood being liable to attack at any time of life. It usually occurs in epidemic form during the winter months. The contagium is from the respiratory mucous secretions and may be carried by means of the clothing or otherwise. The true etiologic factor has not been fully determined as yet.

Measles has no characteristic morbid anatomy. The skin and respiratory mucosa are, and the stomach and bowels may be, hyperemic, and areas of atelectasis are not uncommon. The bronchial lymphatics are also affected.

Under ordinary infection the period of incubation varies from seven to eighteen days, but by direct inoculation, which is possible, incubation is less than ten days.

The initial symptoms are those of acute cold: shivering, sneezing, redness and running of the eyes and nose, intolerance of light, pains in the head, back and bones, with profound weakness. There is gastric disturbance, with furred tongue, and deep redness of the soft palate. The eruption frequently covers the entire mucosa of the mouth. There is fever from the start. 102° or more the first day, arising to 104° or higher by the third.

On the fourth day the eruption, as small fiat papules makes its appearance on the face, gradually spreading downward until the entire body and extremities are involved. As the eruption spreads, the papules enlarge and the whole skin is apparently swollen. The eruption is not confluent, unaffected areas of skin being present between the papules, which are arranged in crescent form. There may be more or less erythema preceeding the true rash. There is no recession of the temperature with the appearance of the rash, the fever persisting for a week or more, when it drops.

On or after the third day, the rash begins to disappear and is followed by desquamation, in the form of branny scales. It is not uncommon to see atypic cases, some of them developing no rash, some no coryza, and others in which other symptoms peculiar to the disease are lacking. There is a hemorrhagic form, due to poor hygiene, in which the onset is furious and which almost invariably, results fatally, in from two to five days.

As complications, there may be pneumonia, laryngitis, edema of the glottis, croup, stomatitis, noma, gangrene of the inside of the cheek, ulcer of diptheria of the vulva, catarrhal inflammation of the middle ear, with or without suppuration, purulent ophthalmia, and very rarely, nephritis. Pulmonary tuberculosis may develop with convalescence, but arthritis, paralysis and anchylosis, rarely.

The late appearance and form of the eruption, first upon the face, combined with the mulberry palate and coryza differentiates it from scarlatina. White or bluish spots with red areolae at the base of the lower first molars, when the mouth is closed, is notably diagnostic. In measles is found no leucocytosis. In rotheln the eruption all over the body is not as marked and the papules have a more shotty feel and there is an absence of the influenza symptoms. Measles has not the backache peculiar to smallpox. Drug eruptions rarely have any of the pathognomonic symptoms of measles.

Uncomplicated, measles is not a disease to be dreaded, although in the slums, in institutions where bad hygiene exists, and with patients of a strumous diathesis, or disposed to tuberculosis, serious complications may be anticipated. Respiratory complications are, as a rule, dangerous and frequently followed by death.

In caring for such cases particular stress should he given to good hygiene. The patient should be in a warm, well-ventilated room, darkened to relieve the eyes. The air should be kept moist by the liberation of steam, which has a tendency to relieve the cough. The bowels should be thoroughly cleared out at the outset, by administration of calomel and podophyllin, followed by an effervescent saline carrying sixty per cent. of pure magnesium sulphate. The latter should be given to full effect. After clearing the bowels they should be kept clean by the use of the sulphocarbolates. Constipation should not be allowed to occur, a morning dose of the saline overcoming this tendency. To control the fever, the Triad suggested by Burggraefve, and consisting of Aconitine amorphous gr. 1-134, Digitalin gr. 1-67, and Strychnine arsenate gr. 1-134, should be given to effect. In using this combination the rule of administration to children, suggested by Shaller, should be followed. It is as follows: One granule of the above (or any other active principle) for each year of the child's age, and one additional granule, dissolved in 24 teaspoonsful, or three ounces of water, the dose being one teaspoonful of the solution, at such intervals as may be indicated to obtain the effect desired. To relieve the violence of the cough, and for pulmonary involvement, emetine gr. 1-67 should be exhibited at hourly intervals, or oftener, bearing in mind at all times not to produce nausea, but to bring the action almost to that point. Codeine gr. 1-67 will relieve irritation and overcome the tendency to cough. Owing to the absence of leucocytosis, nuclein is indicated from the beginning, the dosage being ten drops or more per day, divided. Veratrine is especially valuable where there are pulmonary complications. To bring forth tardy eruption, a cold pack and powerful stimulation of the vitality. In this connection it will be found that a combination of glonoin, atropine and strychnine valerianate, each gr. 1-250 and capsicin gr. 1-67, every ten minutes to effect, will be followed by prompt reaction. This treatment is also valuable in hemorrhagic cases, where the vitality is at a low ebb. As in all infectious diseases, calcium sulphide is indicated and should be given to full saturation. The efficacy of this agent in all such conditions is being gained daily in recognition and it has been found that, where it is pushed to full effect, there is a tendency to abortion of the pronounced symptoms. This agent should not be employed in a half hearted manner, but should be given until its action is apparent by the sulphurous odors emanating from the mucosa, skin and secretions in general. The action of this agent is to overcome the infection, and does so, if pushed to full effect. Complications, if they occur, should be met and treated symptomatically as they appear. Space at this time is not allowed for details regarding this latter subject.

In uncomplicated cases, the prognosis is invariably good, as the majority of cases make prompt and eventful recoveries.

SOCIETY TRANSACTIONS.

New York Academy of Medicine, Section of Pediatrics.

Stated Meeting, March 10, 1909.

ELI LONG, M. D., President, in the Chair.

Papers read: "Gonococcus Vulvo-vaginitis in Children, with results of Vaccine Treatment in Out-patients." By B. Wallace Hamilton, M. D. "On Preliminary Examination of Children at the Dispensary, as a Means of Protection against Contagious Diseases." By Sara Welt-Kakels, M. D. "Helminthiasis in Children." By O. M. Schloss, M. D. "Intraventricular Injections of Flexner Serum in Cerebro-spinal Meningitis, with illustrative cases." By Louis Fischer, M. D. Discussion by Drs. Simon Flexner, Godfrey R. Pisek, Alfred N. Strouse, Samuel J. Kopetzky and others.

Dr. Simon Flexner said that the case presented by Dr. Fischer was the first example of recovery in epidemic cerebrospinal meningitis to come to his knowledge in which there was an impassible obstruction at the foramen of Majendie and in which a purulent exudate was proven to be present in the ventricles. The recovery in this instance was attributed to the use of the anti-meningococcus serum, and he thought it was fair to attribute the recovery to it. While they were all glad to accept the case as proof that recovery did follow the administration of the serum, yet it is not impossible that the washing out of the ventricles may have contributed to the favorabe result; there had been several instances recorded in which the ventricles have been tapped and serum injected; but Dr. Fischer's case was the first case that terminated in complete recovery. Dr. Cushing had a case that died;

Dr. Knox, of Baltimore, had a case that also died; and Dr. Netter of Paris, reported another case and this patient died. A very striking thing was that such a considerable operation could be carried out in these young children and without any danger so far as he knew from the half a dozen cases recorded; there had been no ill results from the intraventricular injections. It was very hopeful, therefore, to see such a splendid recovery and to think that possibly some of the cases of obstruction which formerly terminated fatally might now be saved. One could speculate on how the communication between the ventricles and subdural space was re-established; and conclude that the foramen of Majendie became again patent. It was also possible that the foramina of Luschka contributed to the re-establishment of communication, but for the present this was merely speculation. Perhaps at some time an opportunity would be presented to make observations that would clear the point up.

Dr. Godfrey R. Pisek said he was very much interested in the report of the case presented by Dr. Fischer and, if the opportunity appeared, he certainly would use the method described. Dry tappings, as a rule, were infrequent. He could recollect in a considerable number of lumbar punctures of only having two dry tappings; but he sometimes had to go higher up in the canal before he got fluid. Occasionally if one tapped in the same place, he would get a so-called dry tapping. In the case presented there was undoubtedly an occlusion of the foramen of Majendie. As far as the serum was concerned he would just as soon treat a case of diptheria without antitoxin as a cerebro-spinal meningitis without Flexner's Serum.

Dr. Alfred N. Strouse, in discussing the case said that what rendered Dr. Fischer's case of especial interest to him was the presence of an amblyopia which was unassociated with any perceptible changes in the media and fundus. Careful and repeated examinations failed to disclose the slightest evidence of an oedema or swelling of the nerve, or retinal congestion. In fact the examination was entirely negative. Such cases are evidently somewhat rare, for little mention is made of them in the literature, although it has only been in recent years that routine examinations with the ophthalmoscope have been practiced in cerebro-spinal meningitis.

In the cases that have recently come under my observation the amaurosis could always be explained by the pathological findings in the fundus. In order not to take up the time of the section I shall refrain from a detailed description of the more common ocular manifestations of this disease and limit my remarks to the particular case under discussion.

How can the undoubted blindness in both eyes, in the absence of lesions in the fundus, be explained? If it had been due to a direct extension of the inflammation along the sheath of the optic nerve or to an exudate at the base of the brain involving the optic tract resulting in a neuritis, the ophthalmoscope would have revealed some evidence of their existence. Any involvement of the choroid by the infective process would have been equally apparent. Detachment of the retina, hemorrhage, or external conditions that might have obscured vision could have been even more readily excluded.

We are therefore inclined to account for the amblyopia on the theory of a toxemia. It is quite conceivable that toxins produced by the meningococcus might cause a temporary paralysis of the visual functions, and that as these toxins are gradually eliminated a complete restoration occurs, as in this case. Somewhat analogous conditions obtain in other forms of amblyopia and amaurosis, in which ocular changes may be slight or even absent.

Dr. Louis Fischer, closing the discussion, said that the case he presented was not the first one in which he had employed intra-ventricular injections. Another case, an infant seven weeks old, the one referred to by Dr. Flexner, was admitted to the hospital with symptoms of cerebro-spinal meningitis. After a series of lumbar punctures resulting in dry taps, the ventricles were punctured, and pus containing the meningococcus was found. The ventricles were then irrigated with normal saline solution, and Flexner's anti-meningitis serum was injected. The patient lived 36 days and seemed to show renewed strength after each serum injection. Dr. Fischer reported this case before the International Medical Congress at Budapest, last summer. These two patients were very young, one two months old, the other seven weeks old, hence it was possible, because of the open fontanelle, to utilize the same for diagnosis, and second for the treatment.

The bulging fontanelle suggested intracranial pressure probably due to the ventricles being filled with pus. When this pus was aspirated and the diagnosis confirmed, the serum treatment was commenced. Heretofore all infants under one year have died, and because of this fact he selected the youngest class of cases, believing that we could enter the ventricles from above and inject serum, in addition to the intraspinal route heretofore used for tapping and injecting.

With regard to the closure of the foramen of Majendie, Dr. Fischer thought it best to leave the child alone for sometime in order that it might become stronger, yet he wished to make a lumbar puncture in order to satisfy himself that the communication between the spinal canal and the subarachnoid space was open through this foramen.

In regard to Dr. Pisek's remark about dry tappings, he said that he had performed hundreds of lumbar punctures, but he had not used the same spaces between the vertebrea each time. It should be borne in mind that adhesions would form after such punctures. He said he had been exceedingly careful in the selection of the needle, and he would not attempt to do a lumbar puncture in private practices except with proper and qualified assistants. Although he usually punctured the third interspace he did not believe that one should go above the fifth interspace because of the danger of injury to the cord.

When dry taps are noted, after entering several interspaces at different times, and if meningeal symptoms plus the bulging fontanelle continues, then and then only is one justified in tapping the ventricles. If in an infant through the open fontanelle, if on the other hand the fontanelle is closed then the Kocher method of entering the skull should be chosen.

Preliminary Examination of Children in Dispensary Practice

On preliminary examination of children at the dispensary, as a means of protection against contagious diseases, Dr. Sarah Welt-Kakels, spoke of the danger of infection from contagious diseases of children at the various dispensaries, and urged that action be taken to force examination of children at dispensaries before they are allowed to mingle with others while awaiting treatment.

A hunt for hookworms among children of the lowest East Side, by Dr. O. M. Schloss, of Bellevue Hospital, while it failed to develop more than a single case in which there was any suspicion of the presence of this Southern parasite, has proved that should the lately famous Carolina worm come north it would not lack Manhattan company.

Dr. Schloss found other parasites in 85 children out of 280 that he examined consecutively with regard to whether symptoms were visible or not.

The investigation means that 28.57 per cent of the children examined were infected. Dr. Schloss said that not more than a dozen of the 200 were foreign born—the rest were the children of foreign born parents born on the lower East Side below Third Avenue and between First Avenue and Sixteenth Street.

And in addition to finding eighty-five cases of infection, I found that five of these were double infections.

Dr. Schloss advanced the method by which he thought the infection could be wiped out of the East Side area. "They are due," he said, "to the combination of causes, including common drinking cups, infected water supply, poor nourishment, and the promiscuous playing of children together in multitudes." The percentage of infection is highest among the very poor, but is general among all of the children who appear at the children's ward in Bellevue.

THE NEW ENGLAND PEDIATRIC SOCIETY.

The ninth meeting was held January 29th, 1910, in the Boston Medical Library. Dr. Charles P. Putnam in the chair. The following papers were read:

(1) Alcoholic Cirrhosis in a Boy of Four Years. Report of a Case. David N. Blakeley, M. D. (2) Jaundice in the New Born. Some Illustrative Cases. John Lovett Morse, M. D. (3) Scarlet Fever Prophylaxis with Streptococcus Vaccine. Richard M. Smith, M. D.

Dr. Blakely reported a case of "Alcoholic Cirrhosis in a boy of four years" in which there was history of alcohol, but unfortunately, no autopsy.

Dr. Dunn: (Dr. Blakeley's Paper).

I once saw at autopsy a somewhat similar case in which the liver showed the ordinary atrophic condition which corresponded to the hobnail liver seen in adults. The etiology was traced to the child's going into its mother's room and drinking from her cologne bottle. It seemed a rather interesting case and the facts of the cologne drinking were vouched for by the older children who witnessed it. The liver was very small in that case. There was no history of its ever having been through the large stage at all.

Dt. Talbot: (Dr. Morse's Paper).

The influence of bile on the digestion of fat is rather interesting in this connection. Bile is necessary for the activation of the pancreatic splitting ferment. When it is absent, fat appears in the faeces in the form of neutral fat, in other words, it is unsplit. The examination of the stools, therefore, gives very important information as to the functioning of the bile. In one of these cases, Homer T., the majority of the fat was split into fatty acid and soaps. This meant that the digestion of fat was being carried on normally. The subsequent history of this case was favorable. In one of the other cases, Robert M., as I remember it, the majority of the fat was unsplit. This indicated a more serious disturbance in the digestion of fats, and the fatal termination substantiates this assumption. Reuss, (Hahr. f. Kinderh. Vol. XVIII 1908, p. 729) describes a case of congenital obliteration of the bile ducts with autopsy in which there was a little bile which came through the papilla of Vater into the duodenum. There was partial obstruction to bile and no obstruction to the pancreatic juice. The stools were all on the form of neutral fat. In this instance the fat was not digested because the bile did not come through in sufficient quantity to activate the fat splitting ferments and not because trypsin was absent.

Dr. Rhea: (Dr. Morse's Paper).

I will speak first of the case with congential obliteration of the bile ducts for the reason that it possibly might throw some light upon the cause of the obliteration in at least some of these cases. In this particular case there was very marked inflammation in the bile passage and inflammatory changes that certainly had extended over a quite long time because there was marked change in the epithelial cells that lined the bile passages and the common bile duct. On sections from the anatomical situation, we could not find any trace of the bile duct at all. The gall bladder was represented by a very small cavity, and the obliteration became complete just about at the anatomical situation. There was evidence of thrombus in the gall passages which caused the accumulation of bile in them. This inflammation was certainly of enough age to be perfectly in keeping with the condition in the liver itself. You can easily imagine that the inflammatory process was possibly primary in the gall passages and from there passed up into the liver and lead to the jaundice, these being followed by the cirrhotic condition. The common bile duct was absolutely occluded. The papilla of Vater showed no opening at all. That might be explained by some influence that the pancreas had upon the papilla of Vater.

The other case which Dr. Morse has reported, that of the jaundice without any obliteration of the gall passages and without any cirrhosis, simply presents a picture of obstructive jaundice. There was bile in the common bile duct, because when you pressed upon it bile passed into the intestinal tract, and the obstruction most probably was within the lobule of the liver, that is, the finer branches of the bile passages which became occluded possibly by some very mild inflammatory process. This type of jaundice is a great deal more difficult to explain than the ones you get with obliteration of the gall passage. In accounting for the obstruction when the ducts are not obliterated, I think most probably that the changes are really inflammatory in nature they are not in the common bile duct, they are in the very smallest branches that go down between the liver walls and in between the lobules of the liver, and it takes very little inflammation to lead to their occlusion entirely.

Dr. Chase: (**Dr. Smith's Paper.**)

Sometime ago I made inquiry of Dr. McCollom regarding this treatment, for I have often wished that I had something with which to immunize a child against scarlet fever. At our hospital recently we had a case of a mother with two infants, one seven months, and the other one and one half years, and it seems that at the present time we have very great need of it. I would like to ask where one can obtain this vaccine.

Dr. Smith: (**In Regard to Inquiry of Dr. Chase as to Where One can Obtain the Vaccine**).

Dr. Mark Richardson of the State Board of Health is the man who suggested this work to me. I was able to collect the material from the original works in Russian, the translation having been made by a Russian physician. I have some of the vaccine which was made from cultures taken from scarlet fever throats, and I should like, if an epidemic of scarlet fever starts in some school or asylum to have an opportunity to vaccinate part of the children in order to compare percentages of infection in vaccinated and unvaccinated.

Dr. Pillsbury:

I would like to ask about the epidemic of 1856. My recollection of scarlet fever in 1856 is that it was fatal. At present we have epidemics all through the state but the cases are very mild. The same thing has happened in Newburyport where in one neighborhood there was a large number of cases and the authorities closed the school. In that section there were no deaths and the children were on the street desquamating, and if they were not killed by drugs they recovered with absolutely no danger. I have had scarlet fever cases where all that was done was to isolate the child and give symptomatic treatment. This was in country districts. The child was isolated, with a good sensible mother to take care of it, and with the exception of five or six cases I never saw an epidemic in which they contracted the disease. It seems to me that we do not get the epidemics that we did years ago.

Dr. Chase: (**Following Dr. Pillsbury's Remarks on Dr. Smith's Paper**).

We have only a comparatively small number of scarler fever patients at the Brookline Board of Health Hospital each year. We had something like thirty cases of scarlet fever there sent from Boston the year before last, and also the previous year, the overflow from the South Department, and we safely sent them home again to Boston and none of them went to their "long home." We had one death last year among our thirty-one cases of scarlet fever at the hospital; that was an adult suffering also from chronic alcoholism.

Dr. Cronin: (**Following Dr. Chase's Remarks on Dr. Smith's Paper**).

I understood the reader to say that this vaccine was harmless except in one instance. I would like to ask if Dr. Smith thinks that in an institution like the South Department, where now and then scarlet fever breaks out in the diptheria or measles wards, it would be safe to vaccinate children on entrance. That is to say, would it make any difference about giving the vaccine if the child had diptheria or measles.

Dr. Smith: (**Replying to Dr. Cronin's Inquiry as to Whether it Would Make any Difference to Give the Vaccine to a Child that had Diptheria or Measles**).

A great many of the statistics have been left out of cases in which the vaccine was given. When to given the patients ill with typhoid, pneumonia, and other infectious diseases, no bad results followed; there was a local reaction and slight rise in temperature but nothing else. There are a very few cases where albumin appeared in the urine immediately following it, but soon disappeared, causing no permanent harm.

Dr. Stanton: (After Dr. Smith's Reply to Dr. Cronin).

I would like to inquire if any of the cases which developed from rash, strawberry tongue and sore throat following innoculation with the streptococcus, were a source of contagion.

Dr. Smith: (Replying to Dr. Stanton's Question as to Whether the Children so Vaccinated, in Light Cases, are Capable of Giving the Disease to Other Children).

I do not remember any record in regard to it. As far as I know there was no record of that. It is an interesting fact that all the cases that had the scarlet fever vaccine and later contracted the disease were mild cases even though the epidemic in which they occurred was a severe one.

Dr. Lucas: (Dr. Smith's Paper).

The severity of different epidemics, I think can be explained by the fact that in any locality where epidemics have run with great severity, the next year they are less severe, i.e., with a decrease in mortality, or vice versa—if they start with a small mortality the later epidemic may be a great deal more severe. Usually the disease starts in with great severity in the first epidemic but later on the epidemics become very much less severe.

One of the most interesting points about the use of this vaccine is this new way of determining the etiology of this condition. The experimental work that has been done along this line is the kind of work we are coming to in a great many of the infectious diseases, where it is very hard to find out the etiology, and through work like this is the best way of finding out the value of these vaccines. The statistics that were given are remarkable from the fact that most of the severe compliications that we get and that we know of in scarlet fever are caused by streptococci, and for that reason whether it does check the scarlet fever or not, it may have some value in these severe complications.

Dr. Putnam: (Dr. Smith's Paper).

Dr. Lucas' suggestion seems quite reasonable that the vaccine in these cases may relieve the complicating streptococcus disease and may, thereby, while not affecting the scarlet fever, make it comparatively harmless. I have used the staphylococcus and streptococcus vaccines in cases which were probably due originally to the grip bacillus and the patients have appeared to be greatly benefitted thereby. This appears to be quite analogous.

Dr. Talbot: Directory for Wet Nurses.

In brief, the matter which I have to present to you is as follows, that is, to have a place where wet nurses can go and wait for positions and where the public can go and obtain a wet nurse any time they need them. A public spirited gentleman has promised enough money to run the establishment for about two years, at the end of which time the Directory will be a necessity or a failure. The Directory is to be run under the auspices of the Hospital of the Massachusetts Infants' Asylum, which will charge a nominal fee of ten dollars when supplying the wet nurses. It is not a money making proposition. The wet nurses will have had a thorough physical examination, their babies will be under observation and records of their weights kept, obtaining in this way as much information as possible concerning the quality of the breast milk. The mothers will be taught to be cleanly and how to take care of babies.

Another point which does not interest you, but is a very important part of the work, we hope, is that opportunity will be given these girls to keep their babies with them long enough to become attached to their children so that they will look after them in their future life. At present, they have to put their babies to board when they go to work; the mother then loses her love for the child and wants to get rid of the incubus as soon as possible. We hope that the mothers will have an opportunity to stay with their babies, get fond of them, and take some responsibility toward their future, thus saving the state the expense of rearing more orphans. There being no room in the Hospital of the Massachusetts Infants Asylum for this new line of work, a house in the neighborhood has been taken for the purpose and is under the supervision of a matron who is to have charge of the training of the mothers. The directory will be grateful to any one who can send wet nurses to it or who will use it as a means of obtaining them. The fee need not be an obstacle, as we will have a sliding scale; however, if anyone can afford to give more, they will be helping a good cause along. If anyone wishes to know more about our directory, I will be glad to supply them with more detailed information. Information can also be obtained any time by telephoning the Hospital of the Massachusetts Infants Asylum, Jamaica 132.

Since this notice was given to the members of the New England Pediatric Society, the Directory for Wet Nurses has started. It is now, February 1, prepared to receive and supply wet nurses.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

EDITED BY

KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic, Mt. Sinai Hospital, New York City.

"Functional Neuroses of Children"

J. A. Coults of England discusses the "Functional neuroses of Children" Trans. (British Med. Ass'n., July 1909) and begins with a consideration of Faulty Deglutition. The child, instead of swallowing the milk, after reaching the pharnyx gargles it. The complaint usually interferes with nutrition, as it takes sometimes an hour for the child to get enough for its needs. This affection is due to lack of co-ordination of the muscles of deglutition. Another neurosis is faulty action of the respiratory centre, resulting in rapid breathing or rather panting even to 100 a minute. This conclusion results in a few days old infant and is due to some fault in the respiratory centre. The danger lies in the development of atelectosis. Congenital tremor is another neurosis of infants but very rare. Coults then speaks of Pyloric Stenosis, believing as he does that stenosis may result from spasmaneurosis. He goes on to describe Hutchinson's results with the medical treatment of the disease. The author then speaks of children "neurosis temperament," excitable and emotional, with a proclivity of frequent rises of temperature from slight causes. Coults believes that children prone to convulsions develop in later life a tendency towards epilepsy, habit spasm, migraine and other neurosis. Rickets is another disease that causes definite cerebral envolvement followed by numerous nervous disorders. Cyclic vomiting is then discussed, the author believing this phenomina akin to migraine in older persons as both are neurosis, consisting of headache, vomiting, constipation and pyrexia. Large doses of Bicarbonate of Soda are beneficial in cyclic vomiting. Migraine occurs also in children with greater frequency than is supposed, most cases being called "billiousness" and some even simulating meningitis.

Incontinence of urine is next considered, Coults believing that in most cases the treatment is unsatisfactory. Dr. Leonard Williams advocates the use of Thyroid Extract, believing this condition due to thyroid insufficiency. Night terrors is then discussed and the cardinal points of difference between this condition and simple "night mare" are brought out." Sommolquism" is the name given for talking during sleep, which occurs in night-terrors. With regard to habit spasm, the author advises careful examination of the eyes, ears, throat and teeth, with a view to discovering the cause. A correct diagnosis is essential between Chorea and Habit spasm, otherwise the result may be serious. Hysterical palsy is then considered. The author stating that it is frequently mistaken for the results of poliomyelitis; a differential diagnosis is made by the electrical reaction and the mode of onset.

"The Surgery of Infancy"

J. H. Nicoll in the British Medical Journal, Sept. 1909, brings forward certain views concerning surgical operations in infants and children and divides them into five pleas: 1. That the larger share of operative work should be done in out-patient departments. 11. That the cases relegated to the out-patient department should be largely infants and young children, for her nursing for them is useless and cannot be of any use. Home care, supervised by advice from the hospital is better. III. That sucklings should remain with their mothers after operation. Sudden weaning is harmful. IV. That preparation for operation, such as cleaning of the skin, etc., should be done before the anesthetic is given. V. That early getting out of bed is advisable for children that were operated for hemorrhage or abdominal uction.

"The Treatment of Convulsions"

Chapin, in discussing some of the emergencies in Pediatric Practice (Post Graduate, Feb. 1901) states that convulsions in early life have the same mechanism, whatever the cause, and the main effect should be to bring the child out of the attack. The routine is as follows: Place the child on a table; ice over the occupit and vertex, the feet plunged in hot mustard water; wash out the bowels, using a fountain syringe. Drugs: Bromide, by mouth, 3 to 5 grains every 10 minutes, in bad cases Chloral Hydrate, 3 to 5 grains given via the rectum; in intractable cases, a few whiffs of Chloroform checks the spasms.

"Oxygen in Severe Cases of Pertussis"

E. Weill and G. Mourequand (Lyons Med. August 1909) report the result from oxygen used in whooping cough in 30 cases. The oxygen was used every hour and the results were a marked improvement in the violence of the attacks, although the number of spasms were not reduced, which in itself means but little, for it is the intensity that bespeaks danger, that is of asphyxia. Oxygen produces a quieting effect and the good it does is manifest at once. It stimulates as well, prevents violence after the attacks and increases the appetite of these children. The author prefers this method to that of antipydine or morphine. The oxygen should be administered freely. This method is especially useful in threatened Broncho-Pneumonia following Pertussis.

"Chronic Appendicitis in Children"

Comby, writing in the Arch. fue Kinderbeil Kunde, adduces the statement that this condition is much more common than is believed, and reports his observation on 120 cases of the chronic variety. While appendicitis is recognized in its acute state or during an exacerbation, in the chronic form it is almost always overlooked.

Causes: It may occur in healthy, well fed children, who have no history of previous intestinal disturbances. Heredity may be a factor. Children with the lymphatic tendency—adenoids, enlarged tonsils, adenitis, etc., are especially predisposed. Infectious diseases are also influencing and are potent factors in causation. Naturally previous intestinal disturbances pave the way for the production of this condition. The disease is rare in infancy. — Vague and varied—Comby believes all cases of "cyclic vomiting" to be instances of chronic appendicitis. Nearly every symptom that accompanies chronic Muco-Membranoses Eutero-colitis is a conconitant of appendicial disease. Differential diagnosis, Entero-colitis, cyclic vomiting, hepatic and renal colic and floating kidney may all simulate Appendicitis, but after all they are rare, in children: Salpingitis and coxalgia also may present difficulties in diagnosis. Tenderness and McBurney's point is the main deciding point and can be elicited by careful examination. Comby advises the intestinal operation, which he says is always safe.

"Education of Children Affected with Ringworm"

In a humanitarian spirit, James Nevis Hyde of Chicago discusses this edict and states "that the children of the poor have a right to education; the parents are taxed for this purpose." These diseases are highly contagious, and children suffering with them should be excluded from the school, and while they must be deprived of their rights, the welfare of the child should be considered. But they must not be excluded from other educational advantages. It is impossible to eradicate these diseases entirely, outside of persistent X-ray treatment, which must destroy all the hairs to be effective, no other treatment is effectual. Hyde believes the happy medium to be education of children on separate floors of school buildings, otherwise by entirely excluding such sufferers from school, it will be making criminals of them.—*Illinois Medical Journal, October*, 1909.

"Detection of Blood in the Stools"

M. Triboulet finds the reaction to phenolphthalein superior to that with guaiacum and benzidine, the risk of error being less, and also because it facilitates the discovery of traces of blood of digestive origin and clinically unsuspected, as in cases of (1) old-standing purpura, Barlow's disease; (2) violent intestinal reactions with ecchymosis, acetonaemic disorders in young children, entero-colitis in older children simulating appendicitis; (3) various intestinal complications in pneumonia, measles, scarlatina, and diphtheria. Intestinal discharges, like those met with in certain cases of uraemia, connected with congestion of the digestive mucous membrane and bloody exudation mixed with the stools, are only detected in most cases by the red reaction with phenolphthalein.—*British Journal Diseases of Children.*

"Clinical and Bacteriological Study of Diptheria"

E. E. Wuttke of Halstead, Kan., gives a study of 41 cases of diphtheria seen by himself. Of these cases there were 28 in which there was no membrane in the throat, but in which cultures showed the Klebs-Loeffler bacillus to be present. Thirteen cases had a typical pseudomembrane. In these cases the bacilli were longer and apparently more virulent than in the cases without membrane. These nonmembranous cases ran a milder course, and no paralysis developed after them. Antitoxin was given in all cases. The author believes that such cases are often overlooked on account of absence of membrane, and that all cases of throat inflammations should be examined by culture. Only in this way can we be sure of accurate diagnosis. The author has an original method of incubating the cultures, by placing them within his own undershirt. This saves time and causes rapid development of the colonies.—*Medical Record*, September 18, 1909.

"Relationship Between Quantity of CaO in Human Milk and Haemoglobin"

(*'La Pediatria,' August,* 1909, *No.* 8, *p.* 594.)—C. M. Oneco states as the result of his experiments that—(1) the quantity of CaO contained in the milk of the nurse seems to be in direct proportion to the number of red corpuscles and haemoglobin value of the blood of the nursed infant. (2) The blood of infants reared at the breast of women whose milk contains a high percentage of CaO contains a larger number of red cells and higher haemoglobin value, and the blood of those reared by women whose milk contains a less percentage is poor in globules, etc. (3) The calcium content of human milk seems to proceed in great part from that contained in the organs of the woman herself, and its quantity is only influenced to a very limited extent by the organic calcium contained in the food, and is not modified at all by the administration of artificial preparation of calcium. (4) The calcium content of the nurse's milk should be ascertained whenever any alteration is found in the blood of an infant at the breast.

"Hookworm Infection"

Harlow Brooks of New York describes a case o hookworm disease occuring in an Irish-American of New York, who had contracted it by working with a gang of Italian laborers. The patient had been treated for two years for pernicious anemia in several hospitals, without benefit. It was discovered that the stools contained hookworm ova and parasites. After treatment with thymol, which was unsuccessful and had produced unpleasant symptoms, beta-naphthol was used, and a cure resulted slowly. The parasite was of the European form, which differs from the American parasite. It shows the difficulty of dislodging the parasite when it has been for some time in the intestines.—*Medical Record,* January 29, 1910.

"Spondylitis Deformans"

Sigmund Epstein of New York describes several interesting cases of spondylitis deformans, an affection that is essentially an ankylosing inflammation of the spine, chronic in its course, progressive in its disabling effects, and accompanied by pain. It begins with stiffness, followed by bony hpertrophy and degeneration of the ligaments and cartilages. So much proliferation of bone occurs that the spine is sheathed in bone, as if a thick syrup had been poured around it. Most deformities belong to the type of round-back; some to scoliosis. There are two varieties, one in which the hips and shoulders are also affected, and another in which the spine alone is diseased. The pain is neuralgic in character from pressure of the bone on the nerve roots. Prognosis in early cases is good for complete recovery. Treatment consists in the simple life, exercise in the open air without fatigue, baths, electricity, fixation, and protection of the spine, and good hygiene.—*Medical Record,* January 29, 1910.

"Experimental Investigation into Function of Thymus Gland"

(*'Glasgow Med. Journ.,' August, British Journal Diseases of Children.*)—**Alex. MacLennan** has made an investigation into the function of the thymus gland by excising it from a number of young rabbits. Rabbits were chosen because they retain the thymus relatively longer than most animals. Part of the cost of the investigation was defrayed by a grant from the Carnegie Trust. The conclusions which the investigator arrived at were as follows: (1) The thymus may be a lymphatic gland, but it is so specialized as to be virtually something more; it is one of the series of glands which by an internal secretion regulate the various functions of the body. (2) The gland is really an accessory one, for its function can be taken up by others. It is to be remarked that simultaneous extirpation of the spleen and thymus invariably ends in death. One would therefore infer that the spleen can carry on along with its other manifold functions those of the temporary thymus. Extirpation of the thymus does not give rise to hypertrophy of adenoid tissue elsewhere. (3) The function of the gland is temporary, for as growth advances the gland atrophies, though in man the gland never quite disappears till after puberty. There are cases on record, however, where there has been no thymus. (4) The thymus and the thyroid are closely associated developmentally, anatomically, physiologically, and pathologically. In two extirpations of the gland in the human subject I have found the thymus continuous with the left lobe of the thyroid. The results of experiments have shown that the thymus is unnecessary to the economy when the thyroid is gone, and when the thymus is removed less thyroid suffices. The importance of this relationship is apparent in certain diseases. Thus, there is a type of Graves, disease where extirpation of the thyroid is followed by sudden death, and on post-mortem examination the thymus is found enlarged. An enlarged thymus is credited—certainly rightly in some cases—with being the cause of death in the so-called status lymphaticus, and after removal of the thyroid the enlarged thymus gives rise to the same conditions as produce the so-called thymus death. Therefore, in such cases where thyroidectomy was deemed necessary in Graves' disease, the writer would recommend that the thymus be first sought for, and if enlarged be removed as a preliminary to the thyroidectomy. (5) In certain other diseases, notably laryngismus stridulus, thymusectomy has given good results. The result of thymusectomy is not mechanical, but due to the removal of the internal secretion of the thymus. In this disease and in children subject to "kinks," thymusectomy offers some hope of cure. In cretins, thymusectomy, by reducing the necessity for thyroid secretion, will be beneficial, and ought to be tried. (6) In children who present a fulness over the supra-sternal notch during expiration, straining, or coughing, especial care ought to be taken during surgical anaesthesia, which ought to be of the lightest possible.

"Antidote for Aluminum Phosphate"

E. L. Moseley of Sandusky, Ohio, states that the substance contained in white snakeroot that causes milk-sickness is aluminum phosphate. It affects animals as well as men, causing trembles in horses. Aluminum sulphate placed on fat meat and given as food will cause the same symptoms. But if a little soda is used with the food the effects do not appear. The author believes that bicarbonate of soda is an antidote to the poison, while common salt does not act as such. The poisoning seems to be due to an acidosis produced in the blood; hence the bicarbonate of soda by increasing the alkalinity of the blood counteracts its effects. If given with a vegetable diet the poison is harmless, but with animal food its effects are poisonous.—*Medical Record*, April 9, 1910.

"Calomel in Various Dosage"

Calomel given in a dose of from 3 to 15 grains will cause nausea and emesis, unless the gall bladder be near empty, when it will not. Allow this to remain in your patient too long and ptyalism will result. Where no mechanical obstruction exists in the alimentary tract, you can give an adult 60 grains of calomel at one dose.

The effects are quite different from a 10-grain dose; the dram dose acts as a sedative, will not be followed by nausea or vomiting; it will within four to eight hours bring down two or three copious dark, tarry stools with little or no tenesmus, the patient experiencing none of the unpleasant effects that follow a 10-grain dose of the drug.

This dose may be repeated once next day without fear of ptyalism. Calomel's physiological action, even on the liver, is still unsettled. Given in 1-20th to 1-6th grain doses is sedative to the stomach; 3 to 20 grains will nauseate; but 40 grains is sedative again.

Don't take a scare at such "a wad" of calomel for a single dose; it won't hurt you. Next time you are standing helpless by that little two-year-old cholera infantum patient, having exhausted every means at your command to control the emesis and purging, but still it will not retain a teaspoonful of iced lime water, the characteristic picture pointing plainly to speedy collapse, *then* give him at one dose 20 to 24 grains of calomel in as much sugar of milk. Vomiting will cease instantly, he will sleep a good while, the purging will cease within twelve hours, and you have only to look after *properly* nourishing and stimulating the little fellow.

Autotoxemias, from ptomaine absorption from the digestive tract, are at once wiped out by the "wad" dose, and the prominent symptoms come quickly under control.—*Medical World.*

"Medical Management of Degenerate Children"

Robert H. Porter of Chicago, Ill., says that the delinquent and backward child and the degenerate child are all the result of physical abnormality. Not education alone is needed, but proper medical and physical treatment. There are always signs present of physical impairment in these children. Morbid heredity is the cause of mental deficiency. The writer believes that these conditions are the result of chronic toxemias, mental, chemical, or microbic in origin, combined with an unfavorable environment. Degeneracy is the result of a multiple infection. From this results a neuropathic diathesis, ending in nerve maladies of various kinds. A vicious and intemperate life will intensify this toxemia. The unfit are eliminated by nature by restoring them to the normal, or by intensifying the unfitness until death ensues. A condition of degeneration is seen in the brains of the chronically insane and epileptic. The nutrition of the infant is at fault, and this causes mental degeneration and physical stigmata of degeneration. The neuropathic diathesis is due to physiological chemical defects in the nutrition of the brain and nervous system, and these chemical defects must be supplied by medicines, as well as hygienic and physical treatment given. The patient is below normal in vitality, and needs stimulating tonics, antiseptics, and eliminatives, sometimes sedatives. Thyroid extract is of great value in many cases. In the epileptic the proper use of bromides to control the attacks, combined with other remedies, will convert an idiot into a reasoning being. The author gives clincial examples of his method of treatment of epileptics and degenerates which have been very successful.—*Medical Record*, September 11, 1909.

"Nervous Children—Mothers often Responsible"

Dr. William N. Bullard, in a recent lecture at the Harvard Medical School, says that nervousness in children is often the result of nervousness in the mother, and that nervousness in the mother is always a defect and often a sin. He also says:—

"Such a mother is an injury to her children as long as they are under her care. Every child starts in the world with its nervous system more or less impressionable. If the persons in charge are nervous and irritable, the child will be badly influenced. How often have I said, when such children are brought to me, 'Oh, if I could only treat the mother.' In the majority of such cases, if the parents could be treated the children would get well.

"Nervousness in children may occur alone or in combination with other disturbances, and it may or may not be a serious matter. It is often temporary. In some cases the nervousness is apparently inherited or temperamental. But the surroundings are a strong factor in the production of this condition, and the proportion due to inheritance and that due to surroundings is impossible to determine.

"The child with a so-called nervous temperament should be trained from its earliest year. All physical sources of irritation should be removed. It should be sheltered from all forms of excitement, whether pleasurable or otherwise, in infancy, and trained in self-control later. Discipline should be strictly maintained, but no undue severity should be used.

"Nervous children must not overeat. Children who overeat are apt thereby to become more nervous through the resulting stomach irritation. Therefore, the diet should be a mixed diet of ordinary food and should simply be limited as regards quantity. They should go to bed early and sleep fairly late, and they should have as much fresh air as possible all the time. They should be out of doors as much as possible and should have their windows open at night. In this climate there is no risk in that."—"*Monthly Cyclopedia*"

"Scarlet Fever: Home Treatment and Prevention"

By Robert Milne, M. D. (*Transactions of the Royal Society of Medicine*, Epidemiological Section, 26th November, 1909.)—The details of the treatment advocated by Dr. Milne are as follows:—During the first four days in a scarlet fever case, commencing at the earliest possible moment, pure eucalyptus oil is gently rubbed in, morning and evening, all over the body, from the crown of the head to the soles of the feet. Afterwards this is repeated once a day till the tenth day of the disease. The tonsils are swabbed with 1 in 10 carbolic oil every two hours for the first twenty-four hours, very rarely longer.

The advantages claimed for this mode of treatment are these:—1. When the treatment is commenced early, secondary infection never occurs, and complications are unknown. 2. The infection of others is absolutely prevented. 3. It is estimated that if this treatment were adopted, millions of pounds would be saved annually in England alone. 4. The mother is free to attend to both the patient and her duties, while the father is free to continue at work and the children to go to school. 5. No after disinfection is necessary.

The remainder of the paper is devoted to the substantiation of the method of treatment, and deals with Dr. Milne's personal experience of cases of scarlet fever occuring in Dr. Barnardo's Homes during the past twenty-nine years. When a case of scarlet fever occurs in one of the homes, the patient is either left where he is, or transferred to general hospital wards, where he is treated alongside other patients, including those who have just undergone surgical operations. After ten days the patients are allowed to get up, and to mingle freely with the other patients. Several epidemics are instanced in which the treatment by inunction is said to have prevented almost entirely the spread of infection, and also the have prevented the occurrence of complications. Dr. Milne explains any exception to these rules on one of two grounds.—either the treatment was not commenced in time, or it was inefficiently carried out.

In the discussion which followed the reading of this paper a majority of the speakers seemed to regard with disfavor the views propounded.

BOOK REVIEW

The Medical Inspection of Schools

BY

A. H. HOGARTH, M. B., B. Ch., Oxon., D. P. H.

County Medical Officer of Health for Buckinghamshire; Assistant Medical Officer, London County Council; Medical Officer, Mansion House Committee on the Dwelling of the Poor.— *Henry Trowde, Oxford University Press,* 1909

Even more important than the home relation to the propogation of disease and diseased states in the school and its corralories and subsidaries, and so much more is the school and its proper "Medical Legislation" a factor in minimizing the effects of "bad hygiene." While in the home, disease can be propogated to the immediate family and families in contact, in the school, the spread of disease means an epidemic and is the instigators of epidemics. Hogarth attempts to formulate a routine of school inspection, and includes sub-branches as the States Responsibility. The School Doctor, the School Nurse, the School Clinic, etc. When he states that "The child is the Nation's best asset" he strikes it rightly and when he adds that "the School is the place for control rather than for Dissemination of Disease, "we, as healers must prostrate ourselves to this wise teacher and thank him for his truism.

This book ought to be in the hands of every physician in the land, whether School inspector or not, for its aim is Godly, its text exceptionally well written, its motives humane, its gist is Preventive Medicine and it opens up a field in Medicine, old in existency, and thought but new in propagation. The type is clear, the text simple but scientific, the subject thorough, and the author is in a position to combine logic with fact, and ideas with principles. No better book on that subject have we ever known and much that is written is original.

W. E. FITCH, M. D.,
Editor of Pediatrics,
New York City.

My Dear Doctor: By employing the method below and reporting the results, the undersigned will much appreciate your courtesy.

The following simple method has arrested the paroxysms of whooping-cough in a number of patients in from 3 to 7 days:

Place a pleximeter upon the spinous process of the 7th cervical vertebra and strike the pleximeter a series of moderate blows with a percussion-hammer. The number of blows is of little moment but the blows must be as strong as the child can tolerate without flinching. Some of the mothers accompany the blows with a nursery rhyme or song to interest the child. In the absence of a pleximeter and percussion-hammer, a strip of linoleum and a tack-hammer will suffice. To avoid cutaneous irritation, cotton may be interposed between the spinous process or linoleum and the spine. Each seance during the inter-paroxysmal period should last five minutes thrice daily and the harmless method may be executed by the mother or nurse. The undersigned is desirous of collecting reports on this method of treatment from his colliagues and to test the efficiency of the treatment, it would be well to note the number and severity of the paroxysms before and after treatment in each patient.

The undersigned will explain the rationale of the method in a contemplated contribution and will appreciate the reports sent to him by his confreres.

This method has also succeeded in some cases of laryngisimus stridulus.

DR. ALBERT ABRAMS,
246 Powell St.,
San Francisco, Cal.

PEDIATRICS

EDITED BY

WILLIAM EDWARD FITCH, M. D.

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Vol. XXII MAY, 1910 No. 5

EDITORIAL

CHILDREN AND TYPHOID FEVER.

Typhoid fever occuring in young children is not at all times easy to diagnose as such, and there is little doubt that the disease is often overlooked in children under five years of age. In infants, especially, the symptoms of the malady are by no means clear, the clinical symptoms are frequently anomalous and it is possible and even probable that infected infants in many instances form the missing link in the chain of evidence with regard to the spread of the disease. It will not be rash to assume that infants are attacked with comparative frequency by typhoid fever and die or recover without the malady having been detected. It is know that children are prone to the infection, and therefore the assumption that many suffer from the disease is not unfair. During the recent epidemic of typhoid fever in Montreal, a considerable number of young children were infected, and in the emergency hospital several individuals were treated from two years of age and upwards. That the diagnosis of typhoid fever is difficult in young infants, or perhaps it might be said very apt to be overlooked, will be freely allowed. This being so, it is not likely that young infants are the means of disseminating the disease, to some extent at any rate. Up to recent time, polluted water has been regarded as the only mode of spreading typhoid fever, worthy of much notice. It was held that so long as our water supplies were kept fairly pure the menace of typhoid fever was not serious. In a broad way this theory is based on sound premises. If our water supplies were uncontaminated with the germs of typhoid, then it is unlikely that an epidemic on a large scale will develop in civilized countries. Notwithstanding, the fact that water is still looked upon as the main origin of and chief cause of the spread of typhoid fever, we must revise our views as to the means of propagation of the disease.

Proof has been conclusive that *flies* are important factors in the dissemination of typhoid fever in war time and under unsanitary conditions where masses of people are gathered together, as in the slums of big cities in hot weather. The fly has been effectually stigmatized as a fruitful means of spreading the infection. Within the past few years another manner of propagating typhoid fever has been brought to light. What are known as typhoid carriers is the mode referred to.

Typhoid Mary is notorious in New York and since the publication of the fact that an individual may carry and defecate the disease germs for a period of years, cases of this description have cropped up on every side and have been fully described. It is well within the bounds of reason and cold truth, that typhoid carriers are more widely responsible for the spread of typhoid than is at present imagined. Many epidemics of obscure origin may have had their rise in human carriers.

In the Lancet, Jan. 29th Dr. Alice Oberdorfer reports a case of typhoid fever in which it certainly seems as if the infection were spread by an infant. The mother died from typhoid when the infant was eleven months old and in two houses in which it was afterwards taken persons sickened with the disease. The child was fretful, cross, and constipated, temperature varied between 101° F. and 104° F. and its blood showed a positive Widal reaction. Since the publication of this case to the lancet other instances of similar nature have been reported to the same paper. A question of great interest is, as to what is important in an infant, shall constitute a diagnosis of typhoid fever. It must be borne in mind that the disease does not run the typical course in infants that it runs in adults. A temperature varying between 100° F. and 104° F. with constipation, fretfulness would not be sufficient to warrant a physician to state that an infant with such symptoms was suffering from typhoid fever, although they might be sufficient to cause him to regard it as a suspicious case and to order that due precautions be taken. A positive Widal reaction and the discovery of typhoid germs in the excreta would be conclusive proof. Therefore it may be stated that a high varying temperature, with Widal reaction and the discovery of typhoid germs in the excreta may be looked upon as proof positive that an infant has typhoid fever. But taking into consideration that an infant with typhoid fever will be a dangerous source of infection. Any one of these symptoms with a high varying temperature alone, with constipation should be regarded as sufficient reason for taking necessary precautions. It appears to have been demonstrated forcibly enough for all practical purposes that infants suffer from typhoid fever with comparative frequency. That the disease in the young is hard to correctly diagnose and seeing that as typhoid carriers they are liable to be a menace to the public health in all cases in which doubt exists as to the malady, precautions against the spread of the disease should be employed.

SOME THOUGHTS ON ZYMOTIC ENTERITIS.

We are publishing in this issue a paper "The Etiology of Zymotic Enteritis" (epidemic diarrhea) by Dr. Ralph Vincent of London, England, to which we desire to direct the attention of our readers and at the same time remind them that this disease constitutes an important factor in infant mortality and that with the return of each summer there occurs an outbreak of epidemic diarrhea, often accompanied by a very high death rate, much, higher in comparison with the death rate of adults for this same period.

In the first place epidemic diarrhea is a seasonable disease, a fact that it is so well established that it is hardly necessary to mention it. It is essentially a disease of the warm season, and as a rule the largest number of cases occur during July and August. At, or about the beginning of June the disease begins, it reaches its acme at the end of July or beginning of August, and then falls, abruptly at first, then more slowly, and it is not until the very end of November that the point of normal mortality is reached. The prevalence of the disease, is shown by the number of children attacked. This is a general statement, and it must be remembered that the influence of one or more factors may tend to modify the curve.

The relationship between epidemic diarrhea and temperature was first fully worked out by Ballard and his conclusions regarding such have become classical. His main contentions were that the summer rise of diarrheal mortality did not commence until the mean temperature of the soil as recorded by the four-foot earth thermometer attained a temperature of 56.4° F., no matter what temperature may have been reached by the atmosphere or in the earth at a depth of one foot; and that the decline of diarrheal mortality coincided more or less precisely with the decline of the temperature at a depth of four feet, the process of fall begin more slow at this depth than in the other two cases mentioned above. Dr. Allen writing on this subject in the British Medical Journal of Diseases of Children quotes Nash, who questioned Ballard's contentions at a meeting of the Epidemiological Society, and he was supported by several fellows who testified to the fallaciousness of

Ballard's critical temperature of 56.4° F. at a depth of four feet. It sometimes happens that the increase of zymotic enteritis does occur when the four-foot thermometer registers about 56 F., but this is certainly not always the case. Anomalous cases are from time to time noted in the annual reports of medical health officers. It is also common experience that an increase in numbers of diarrhea cases does not immediately follow a high atmospheric temperature. This increase does not as a rule show itself for a week or ten days, even though the temperature of the air has in the interval, fallen.

Rainfall also plays some part, and it is found that epidemic diarrhea is more prevalent in hot and dry than in wet and cool seasons. There will be a very remarkable reduction in the mortality from diarrhea during cold or wet seasons, a fact that has been commented upon by many health officers in their annual reports. Dr. Allen again quotes "The Hospital" for November the 30th, 1907, in which the effect of the cold summer on the death-rate is made the subject of a short paper.

Deaths of Children Under one Year of Age

Week............	30	31	32	33	34	35	36	37	38	39
Mean number of death under one year, last five years.	1356	1610	1884	2070	2010	1849	1953	1866	1724	1496
Ditto, 1907	761	755	785	840	887	872	932	961	1142	1354

It is thus evident that the cold, wet season was responsible for an enormous reduction in infantile mortality. It represents a saving of between eight and nine thousand lives in the seventy-six great towns alone, chiefly from zymotic diarrhea. Not only is the mortality much higher in hot, dry seasons, but the attack rate is also higher. This statement will be endorsed by all who are engaged more especially in pediatric work. Allen again says, British Journal Diseases of Children, "I was in different districts in the summers of 1906 and 1907, so that I cannot give figures of my own that are comparable, but it is nevertheless of interest to note that while in the summer of 1906 I saw over 200 cases of summer diarrhea, in the following summer saw only about a dozen cases. In the month of August, 1908, I saw about 50 cases." Heat probably plays its part as an aetiological factor in diarrhea in virtue of its favoring the growth and development of organisms. Griffith, however, holds that heat has some share in the causation of diarrhea quite apart from growth of bacteria and believes that it acts partly by its depressing action on the nervous system, and particularly the vaso-motor system of the child, though partly, also, by interfering with digestion, so that bacteria more easily multiply in the intestine.

THE BABY'S DIET.

The problem of artificial feeding is one of growing importance, especially to the Pediatrist, the family physician and obstetrician, all of whom are especially derelict in their duty if they fail to inform themselves upon the great advances which have lately been made in this direction. The cause of much of the indigestion, inanition and marasmus seen during infancy is laid during the first few weeks of life, but the importance of starting the diet right from the very outset is not yet sufficiently appreciated. An attack of indigestion must be regarded as a serious misfortune for a child; the younger the child, the greater the misfortune. A single careless feeding may produce an acute indigestion which will be the starting point of a long series of digestive disturbances. A few weeks of improper feeding may so derange the digestive processes that the infant does not regain its normal digestive power during its first year.

The error is quite too common of looking upon the body as a machine, any derangement of which will be set right by simply removing the cause. The human body is not a lifeless machine, but a combination of living tissues, each of which has its own functions to perform. Stopping the original cause of disturbance does not, therefore, usually stop the symptoms. A child that has been improperly fed can rarely be set right at once by the administration of proper food. If the indigestion is due to bacterial action, or to a vegetable ferment, it will probably continue for a certain time under the most favorable feeding, because the germ or the ferment remains to act upon everything that is introduced into the stomach. An intestinal catarrh, once begun, is *very* slow and difficult of cure, and will prolong the indigestion.

When the digestive secretions are impaired, or undergo any decided change, they do not at once recover themselves or adapt themselves to changed conditions even if those conditions are perfection itself. The nervous system, notably that portion which presides over the digestive functions, readily acquires habits and peculiarities of action which continue after the causes which generated them have been removed. The debility and anemia which quickly follow in the train of improper diet are felt by the digestive organs in common with the rest of the body and impair their action long after the cause is removed.

The younger the child, the less is its resisting power, and the more potent do these various factors become. There is no more difficult task than the remedying of an impaired digestion in a young infant. In no place is the old adage that an once of prevention is better than a pound of cure more true than in medicine; in no place in medicine is it more true than in the management of early infancy.

Error is constantly being made in allowing new-born babies to have too much food, to have it at irregular intervals, and without proper preparation.

Even in the case of breast-fed babies, the doctor has an important duty to perform in giving rigid instructions regarding regularity of nursing, the duration of each feeding, and the management of the breasts. The importance of engendering right habits in the breast-fed infant is almost as great as in the case of the artifically fed. The well-being of the infant, as well as the well-being and comfort of the mother, depend greatly upon the habits formed during the first few weeks. Whether the baby be breast-fed or bottle-fed, the physician is derelict in his duty, if he neglects to start the diet right.

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ORIGINAL ARTICLES

RHEUMATISMUS ACUTUS.

Rheumatic Fever. Polyarthritis Acuta.

BY

HERMAN B. SHEFFIELD, M. D.

Instructor in Diseases of Children, New York; Post Graduate, Medical School and Hospital, New York City.

Acute inflammatory rheumatism is an infectious disease with a specific predilection for the fibrous tissues and serous membranes, although the muscular and neural structures are not exempt from it.

Like other infectious diseases rheumatic fever is most prevalent in certain climates and seasons of the year. It presents a prodromic stage of variable duration, which is characterized by chilliness, languor, etc. Like the eruptive fevers it is manifested by general febrile disturbance with local lesions. To a certain extent it is self-limited—with exhaustion of the fertile soil in one place, the inflammation "jumps" to another place. It ordinarily yields promptly to specific medication—in this respect resembling malarial fever.

After a brief prodromic stage, the symptoms of acute rheumatism usually set in suddenly, with chills, rise of temperature, vomiting, and vague pain in several parts of the body. In very young children the onset is not rarely associated with cerebral symptoms, especially convulsions. Older children often complain of sore throat, and in some cases articular swelling forms the first and principal manifestation of the affection. The disease once established it differs in its symptomatology and course but little from those observed in rheumatism in the adult, except, as will be seen later, that there is a greater tendency towards cardiac complications, while the articular involvement is usually less pronounced.

The knee and ankle, elbow and wrist are the joints most commonly affected, occasionally, also those of the phalanges and hip. The articular involvement is accompanied by stiffness slight redness, swelling and excruciating pain, the latter especially on moving or handling the parts affected. The inflammation may abruptly cease at one or more joints and as suddenly attack others. During the acute stage the temperature varies between 102° and 104° F., and as the inflammation "jumps" from joint to joint there is a sharp rise of temperature. Correspondingly the temperature falls with abatement of the local manifestations. The urine is usually scanty and high colored, filled with urates, and occasionally contains traces of albumin. The characteristic sour (lactic acid) sweats observed in adults are much less pronounced in children. There is no definite limitation to the duration of the course of the affection. Mild cases may, after pursuing a febrile course, a few days, duration of either subside entirely or enter into a subacute afebrile stage and for weeks and months be manifested by vague articular and muscular pain, and ultimately and either in complete recovery or leave behind some form of subacute or chronic heart disease. Indeed, it is usually in such cases that the heart affection is overlooked and accidentally discovered some times (years!) later, without being able to disclose a rheumatic history.

Severe cases may run a febrile course of from 3 to 5 weeks, and sometimes of as many months if left untreated. It is well to remember that the gravity of an attack is not always commensurate with the severity of the articular involvement. In quite a number of cases endocarditis or pericarditis or both may predominate while the other symptoms are barely noticeable. Hence the importance of a routine and careful examination of the heart of children suffering from rheumatism and "growing" pain, or chorea—which the latter disease is closely allied to and may precede, accompany or follow rheumatism in its various forms.

The earliest symptoms of rheumatic endocarditis are increase of frequency and intensity of the heart beat and precordial pain. This is soon followed by the usual physical signs of endocarditis—those of mitral regurgitation predominating. Endocarditis forms the most frequent complication (about 60%) of inflammatory rheumatism and usually sets in within the first ten days from the onset. Pericarditis is observed only in about 10% of the cases, and somewhat later in the course of rheumatism than endocarditis. It is manifested by a serous exudation which may rapidly, and unnoticeably disappear, or persist and lead to pericardial adhesions and their accompanying more or less grave sequelae.

Less frequent complications are pleuritis and pneumonitis. Both of these affections are ordinarily limited to the left side. The pleuritic effusion may be serous or serofibrinous and is most frequently associated with pericarditis. Of still less frequent occurrence are peritonitis and nephritis. The abdominal pain not infrequently complained of by children during an attack of rheumatism is usually due to muscular hyperesthesia and not to peritoneal involvement.

As in adults rheumatism of children may also affect the *muscles*. Rheumatic torticollis is especially common, and in severe cases is apt to be mistaken for servical spondylitis. Muscular rheumatism affecting the muscles of the leg may give rise to symptoms (pain on motion, lameness, stiffness, etc.) simulating coxitis. As previously mentioned rheumatism of the abdominal muscles may simulate peritonitis, while rheumatism of the intercostal muscles may be mistaken for dry pleurisy. In all these cases a diagnosis can usually be arrived at by bearing in mind the pathognomonic symptoms of the affections they resemble, and the facts that muscular rheumatism promptly yields to the salicylates, and that as a rule there is a history of involvement of other groups of muscles.

Rheumatism may also affect the periosteum and give rise to thickening of the underlying bone, which condition with the accompanying pain and fever, may simulate incipient osteomyelitis. From what has been said it can readily be seen that the diagnosis of rheumatism in its various phases is far from being easy.

Attention has been directed to the numerous diseased conditions muscular rheumatism may be confounded with. *Articular* rheumatism may be mistaken for: Syphilitic, gonorrheal, tuberculous, the so-called septic arthritides, scurvy and its allied affections or osteomylacia.

In our endeavor to differentiate rheumatism from the diverse forms of articular and peri-articular inflammations we must bear in mind the facts that rheumatism is a primary febrile affection, as a rule, sudden in development; its inflammatory process is transient, and its localization multifarious and shifting; its course is promptly and often permanently influenced by the salicylates.

Epiphysitis syphilitica develops slowly, in the first few months of life—rather exceptional for rheumatism—in association with other symptoms of congenital syphilis. It runs an afebrile course and yields promptly to antisyphilitic medication.

Arthritis heredosyphilitica (tarda). Develops gradually,and affects principally one or both knees. It is usually associated with other syphilitic symptoms especially parenchymatous keratitis. As a rule, subjective disturbances are incommensurate with the extent of the local signs, and the arthritis is but rarely accompanied by inflammatory symptoms. It yields promptly to antisyphilitic medication. Puncture of the swelling reveals serofibrinous fluid with spirochetae Wosserman's reaction often positive.

Arthritis gonorrheica. It occurs as a complication of gonorrheal ophthalmia, urethritis or vulvovaginitis. It is most frequently limited to one knee, more rarely both knees, the maxillary or sternal articulations, and is accompained by pronounced inflammatory symptoms, local and general. The articular involvement is more lasting than that of acute rheumatism, and resists anti-rheumatic measures.

Arthritis tuberculosa. It develops gradually, usually remains limited to one joint, and resists anti-rheumatic treatment. Atrophy of the affected limb sets in early, and an X-Ray examination often shows involvement of the bone. Von Pirquet test positive.

Arthritis septica. Septic or infective arthritis arises seccondarily to sepsis (e. g. purulent arthritis in sepsis neonatorum) or acute infectious diseases such as typhoid fever, influenza, pneumonia, diphtheria, scarlatina, etc. The history is the most reliable guide in the diagnosis, and the finding of the streptococcus, pneumococcus, etc., in the sero-purulent fluid obtained by exploratory puncture of the swelling is decisive.

Scorbutus, (*Barlow's disease*) *Purpura hemorragica and Hemophilia* (with sanguinous effusion into the joints). These may be mistaken for acute articular rheumatism. In the hemorrhagic diseases however there are hemorrhages from and into other parts of the body. The articular swelling is not as evanescent. Fever is usually absent or slight. Barlow's disease is observed in young infants, who very rarely are attacked by rheumatism. Anti-rheumatic treatment proves useless.

Osteomyelitis. The swelling does not appear until a few days after the onset of the disease, and has its centre, not opposite the joint, as in articular rheumatism, but above or below, opposite one or other of the epiphyses of the bones entering into the formation of the joint. In advanced cases the swelling extends along the shaft to a variable distance. Rheumatism is rarely limited to a single joint, and its swelling never suppurates. Leucocytosis is absent in rheumatism and, as a rule, marked in osteomyelitis. A skiagraph is helpful in the differential diagnosis.

Rheumatic fever *per se* is very rarely fatal, but very few patients emerge uninjured from a severe attack of rheumatism. In probably two thirds of the cases some form of heart disease is acquired which sooner or later manifests evidence of its destructive character. This obtains particularly in recurrent rheumatism as well as in cases improperly cared for as regards rest and specific medication. Rest in bed is the most important therapeutic measure in the prevention of grave complications and sequelae, and should be enjoined at least during the febrile course of the disease. Medicinally the salicylates have proved specific in the treatment of all acute rheumatic conditions and their administrations should be continued until every vestige of the disease has disappeared. In the beginning the salicylates should be pushed to their full tolerance—say one grain of the sodium salicylate for every year of the child's age, every two hours, until the acute symptoms have been arrested, then every four or six hours according to indications. With the appearance of cardiac complications the iodids, in small doses, should be added, and if necessary also digitalis. For the relief of articular pain and swelling the joint should be enveloped in absorbent cotton wrung out of a warm saturated solution of bicarbonate of soda. The compress should be covered with oiled silk and flannel bandage and changed every two to four hours. When the pain is very acute I found the following very sevicable:

Olei Gaultheriae
Cuajacolis
Ichthyolis, a a 1 oz.
Adipis Lan, 1 oz.

Sig. Apply gently twice a day, and cover with flanne bandage. Acute rheumatism being an infectious disease we we have no faith in "mathematical dietetics" as a cure of the disease, hence do not employ any specific dietary, and limit ourself to a "fever diet" during the febrile stage of the disease and to easily digestible food of all sorts later. This has the advantage of maintaining the nutrition of the patient who at best is weak and anemic. A course of the iodid of iron and cod liver oil is always in order in the convalescent stage, and a sojourn in a dry and high inland resort will prevent recurrence and chronicity.

127 W. 87th St.

No lie can hurt a man for a long time. There is little use in spending your time trying to correct lies. The lie itself will drop like a feeble shaft against the armor of truth.

*PERSONAL EXPERIENCE WITH ILEO-COLITIS

BY

D. J. MILLER, M. D.

Atlantic City, N. J.

Visiting Physician to the Children's Hospital, Philadelphia.

It would appear, at first sight, to be decidedly a work of supererogation to present a paper on the treatment of ileo-colitis. This is a theme upon which much has been written—the profession, certainly, is not without information upon the subject. Our journals and societies teem with papers of various degrees of excellence on just such matters. hence, one should not lightly add to the ever increasing stream, unless one can give good reasons for so doing. In this case, the motive is that this is intended not as a didactic paper or as an academic discussion; but, rather, as a record of personal experience,illustrating a method of treatment that has gradually evolved itself during many years of observation, and that, perhaps, contains little that is new or original, although it may possibly offer some points as useful to others as they have been to the writer.

In using the term "ileo-colitis" to designate the class of cases to which the paper especially refers, it is fully recognized that it is impossible to classify the summer diarrheas of infancy from the symptomatology alone, while a pathological division is possible only after death; and even then the diagnosis is not always possible; since, as a rule, the extent and severity of the lesions differ greatly, and frequently do not correspond with the symptoms observed during life. The mere presence of blood and mucus in the stools is not, in itself, an evidence that the case is one of ileo-colitis. These may be present in any case in which the infection of the intestines is deep enough. Such elements may even appear in the non-infectious diarrheas, mucus being a constant symptom in many intestinal disturbances of prolonged course; although Dunn has shown that mucus and blood are more liable to occur in ileo-colitis, in the proportion of 1:4.

Again, cases that begin as a simple, or fermental diarrhea, may suddenly present the symptoms of ileo-colitis or cholera infantum; the different forms having a tendency to merge into one another, a case often exhibiting at one time during its course the symptoms of one, and at another time, those of another, variety of diarrhea. Notwithstanding this, there is clinically a well-defined form of infectious diarrhea usually denominated ileo-colitis or colitis, according to whether the lesions have their principal seat in the lower ileum and colon, or in the colon alone. In this form, the bacillus of Shiga and Flexner is most frequently found; although other bacteria (Streptococcus, Bacillus pyocyaneus and Proteus vulgaris) may, at times, be present.

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*Read before the Philadelphia Pediatric Society; March 22, 1910.

This is the affection whose treatment is considered in this paper. It is quite often, but not always, a primary affection; and has a well-defined symptomatology, with more pronounced pathologic lesions than the other forms of infantile diarrhea. The onset is acute; the dejections, numerous and small, composed principally of mucus, often containing blood, and occasionally, pus and membrane. Pain is pronounced, and tenesmus frequently severe. The discharges are usually odorless, but may be putrid; sometimes they are mixed with fecal matter, sometimes colorless, and sometimes green. Except at the onset, vomiting is not conspicuous. Gas is frequently troublesome. Fever may be high, and is likely, after the first few days, to run an irregular course. In comparison with the abrupt onset, the course is often surprisingly short; again, it may be prolonged, often persisting for weeks, or even months.

Treatment

At the beginning, castor oil should be given, in order to empty the intestinal canal thoroughly. It should be administered in a sufficiently large dose, viz: one teaspoonful at six months; two teaspoonfuls at one year; three teaspoonfuls at eighteen months; and a tablespoonful at two years. It must be given ice-cold. If rejected, the dose must be repeated in from half an hour to an hour, the child being kept quiet upon its back. If again rejected, a third attempt may be made, with a sinapism upon the epigastrium (1:4 or 6).

Calomel, I seldom give. It is an irritant, and does not sweep the intestines with anything like the efficiency of castor oil. When employed, it may be given in one-tenth grain doses, up to one grain, followed, in an hour, by a saline.

Other purgatives are milk of magnesia (half to three-quarters of an ounce at the age of one year), although this is usually too mild in its action to be of much service. Better than this is the sulphate of magnesium, in one-third to one-half dram doses at the age of one year, in an aromatic water or syrup of ginger. This is difficult to administer in infancy; older children take it better.

Vomiting is seldom troublesome. If excessive, it is best relieved by stomach-washing, or by teaspoonful doses of very hot water or lime-water, with or without small doses of Sp. Chloroform and bismuth.

Dietetic treatment. Simultaneously with the giving of the purgative, whatever food the child is taking must be stopped. It matters not what the food may have been, whether milk or milk-preparations; whether condensed or malted milk, or buttermilk; whether broths or cereals, or solid food—it must be discontinued at once. For twenty-four hours, nothing at all should be given; or nothing but water, cold or hot, as the patient may desire (half an ounce to three ounces every two hours). No drugs should be administered during this period, *specially no bismuth or opium.* The purgative should be permitted to act freely. The initial pain, if severe, may be relieved by hot carminatives, such as cinnamon, peppermint, caraway and dill water; hot abdominal poultices; hot sinapisms (1:4 or 6;) smal hot rectal injections (105°—111°); and, as a last resort, paregoric (fifteen to twenty drops, at the age of one year, every four hours).

After twenty-four hours of preliminary starvation, feeding may be resumed. The food must be bland, readily absorbed, leaving little residue, and in small quantities. The *last is very important.* I do not subscribe to the teaching that the quantity of food given at this stage of the disease should be as large, oralmost as large as in health. Smaller quantities, it seems to me, are less liable to provoke peristalsis; and, as the stools are usually small and not watery, there is not the same necessity for fluid as in other forms of diarrhea. I usually commence with cereal* gruels, preferably with rice gruel, and occasionally with barley or arrowroot gruel. *Seldom more than two ounces*—or, at most three ounces—should be given, and *never more frequently*, than once in four hours. These gruels may be slightly sweetened or unsweetened; and weak or strong, as the temperature is high or low (the higher the temperature and the younger the patient, the weaker the gruel).

On the alternate fourth hour, panopeptone or the liquid peptonoids are given, in from one to two ounces of water (half a dram, at four to six months; one dram, at one year); but sometimes they are refused in this way, and must be given alone and followed by the water. Frequently I substitute for the panopeptone a beef-juice, half to one teaspoonful, alone or in water or albumin water (one to two ounces). Occasionally, the egg-water and beef-juice, or the beef-juice diluted, replaces the cereal (*in two-ounce quantities only*), in case the latter is refused but; usually I find beef-juice preferable, as albumin-water often disagrees, giving rise to gas, and, if given in large quantities, causing a rise of temperature and symptoms of toxemia.†

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*The gruels may be prepared with cereal flours, in the usual way. I prefer to use the whole grains, thus:

Rice Gruel.—Take two or three tablespoonfuls of washed rice; add one quart of water; cook slowly, in a double boiler, for one or two hours, or until reduced one-half. Strain and salt. A weaker gruel may be made by using but one tablespoonful of rice.

Barley Gruel.—Take two tablespoonfuls of washed pearl barley-grains; add one quart of water; cook slowly in a double boiler for one or two hours, or until reduced one-half; strain; and salt.

Arrowroot Gruel.—Take from one teaspoonful to one tablespoonful of arrowroot, according to the strength desired; rub into a paste with a little cold water. Then stir gradually into a pint of boiling water, and boil five or ten minutes; salt.

†As an instance of this tendency of albumin-water, I would cite the following: Baby S., twelve months old, with severe

I am quite aware of the objection to the use of pre-digested foods, such as panopeptone, etc., viz: that they possess but little nutritive value; are expensive, and, if given in amounts sufficient to nourish an infant, would produce serious alcoholic poisoning. On the other hand, as their alcoholic content is known, the amount given can be easily regulated; they are a pleasant form of administering stimulants, less apt to derange the stomach than whiskey or brandy; and they enable one to withhold food, when necessary, and yet satisfy the family that the child is being fed. A good substitute for these preparations which I frequently employ as an alertnate mildly stimulant food is a mixture of equal parts of sound old sherry wine and water or cinnamon-water. This may be slightly sweetened, if necessary, and given in teaspoonful doses, to which 20 to 30 drops of beef-juice are added to color and flavor it.

Proteids, as a rule, are well borne in this form of intestinal trouble, and are theoretically indicated; but they should not be given in large quantity. This is particularly true of meat-broths, which often increase the discharges; and of egg-water, which may cause foul stools or give rise to signs of general toxemia. Practically I never use meat-broths, save in very small quantities, to flavor cereal gruels.

When food is persistently refused or is vomited immediately, often simply because of the infant's distaste for it, some force is permissible. I usually direct that the food be offered; and that, if it is refused, the child be compelled to take half a dram or a dram of peptonoids or panopeptone, or the same quantity of the mixture of sherry and beef-juice referred to above. In obstinate cases, gavage is resorted to. Either of these methods usually compels submission or relieves vomiting.

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colitis, absolutely refused gruel. Albumin-water was given, which, owing to the importunity of the mother, was increased in amount, until, on the tenth day, eight ounces every four hours were being taken; 48 ounces daily. Great restlessness, high temperature, and severe watery diarrhea ensued, requiring morphine, irrigations and other active treatment for their control. This case also illustrates how an ileo-colitis may suddenly assume the symptoms of cholera infantum.

After three or four days, sometimes after forty-eight hours, according to the severity of the case, half an ounce of pasteurized fat-free whey is added to the two-ounce feeding of rice or other gruel. At the close of twenty-four hours, if there has been no material temperature rise or alteration in the stools, or other marked untoward symptom, a second half-ounce of whey is added, and so on—half an ounce of whey being added daily, until one-half or two-thirds of the food is whey (usually 4 or 4½ ounces in all). Close watch, in the meantime, being kept upon the stools and temperature. Very often the whey may be increased more rapidly than this; every *case must be judged by itself.* The whey is continued and increased, even if the temperature is elevated (102 or 103°); but *not if it is very high.* This is also done despite the presence of greenish or numerous stools—as high, indeed, as ten or twelve daily. Should the addition of the whey cause a material rise of temperature, or an unfavorable change in the stools, it is discontinued; and, after forty-eight hours, resumed, or condensed or malted milk tried (one dram to six ounces). Sometimes buttermilk, fresh or condensed, is used.

Whey is employed as a preliminary milk-food because, first, it leaves little residue; and as the difficulty in digesting whole milk and milk-foods in diarrhea is probably more often due to chemical and physiological reasons than to micro-organisms, whey would seem to be, and is, a most useful food in ileocolitis. Then its bacterial content is far below that of whole milk and it has the advantage of usually being readily taken by infants. It is prepared by adding a junket tablet or a teaspoonful of essence of pepsin, or liquid rennet, to a pint of milk; and heating it gently until it coagulates. When a firm clot has formed, it is broken up with a fork. It is then strained through a towel or a napkin—not through cheesecloth.

When it is found that the infant can take, without detriment, a mixture containing two-thirds whey, whole pasteurized milk is gradually added, one teaspoonful each day, up to half an ounce; then half an ounce is added every third, fourth, or fifth day, until half or two-thirds of the mixture is milk. Formerly I used cream; but as I repeatedly found, when the percentage of fat rose to or above two per cent. or even below this, that curds appeared in the stools, to disappear with the substitution of whole milk, I now invariably confine myself to whole milk (exceptionally to skim milk or peptonized milk) until convalescence is well established, when the percentage of fat may be slowly raised to the amount formerly taken.

By this early administration of milk-preparations, the nutrition of the patient is maintained, the temperature gradually falls, the stools improve, and the return to health is hastened. The method, still practised and advocated, of withholding milk for long periods, even until the stools are nearly normal, I no longer follow. The milk-substitutes employed in this practice are of low nutritive value, and are just as efficient culture-media—in the laboratory, at least (the reason usually given for the rejection of milk)—as milk itself. Besides, it has long appeared to me that the feeding problem in these cases is more a chemical and physiological question than a bacteriolgical one.

Occasionally the greenish color of the discharges persists late into the disease, the stools being composed largely of greenish mucus, but without other untoward symptoms; or the movements may become greenish at any time during the course of the attack, especially when milk is being given; although this may occur when milk is withheld. This symptom is often quickly relieved by adding to each feeding one or two or three teaspoonfuls of condensed buttermilk, or of freshly prepared buttermilk; or by feeding upon buttermilk alone for a time. The change thus produced may be attributed to the modifying action of the acid, and not to bacteria, since the buttermilk is sterile.

During convalescence, a yeasty and fermented condition of the stools is sometimes noted, the movements, at the same time, becoming slightly more frequent. For this, also, buttermilk is effective, with a diminution of carbohydrates, especially sugar and fat (particularly fat), combined with the exhibition of a mineral acid—usually hydrochloric acid. Indeed, the latter alone will frequently correct this condition.

After the patient has demonstrated his ability to digest a mixture containing from one-third to one-half milk, the sailing is plain. Young infants may gradually resume the formula suitable to their age, while the diet of older children may be supplemented with farinaceous jellies of rice, barley, arrowroot, and cream of wheat;* and, if over eighteen months, with rare scraped meat. This course is advisable in older infants, even though the stools contain considerable mucus, provided that they are partly composed of natural fecal matter. Especially useful is a thick rice-jelly, served with butter and salt. Indeed, this is an admirable food as early as the fourth day in mild cases in children of and over twelve months, with appetite returning and a temperature at or near normal. I have never seen the farinacea produce gas or any evidence of fermentation and decomposition; although sugar, fat, and egg-water have this tendency, often very markedly.

In prolonged cases, the fermented milk-preparations, Kumys, matzoon, and, especially, buttermilk, are very useful. Great care must be taken with the diet of these patients for a long time after apparent recovery. Relapses are easily provoked, particularly by errors of diet—a very real danger at twelve months and over. Directions should be explicit and written. Green vegetables, stewed and fresh fruits, potatoes, candy, and oatmeal are particularly to be avoided, even with children accustomed to take them. After all is said, the dietetic management of ileo-colitis (especially in young infants and in spoiled and badly fed children), while it is the most important part of the treatment, is, at best, beset with difficulties, even for the most skillful. Large experience, abundant resources, infinite patience, painstaking attention to detail—these are the factors that tell. No set rules can be given or followed: "Nothing will take the place of brains," as Jacobi has tersely remarked.

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*Cereal jellies are prepared in the same manner as the gruels, except that they are stronger—from twice to two and a half times as strong. In the case of rice (one cup of rice and three cups of water); after the cooking (two hours), pass through a fine sieve. Barley (four to six tablespoonfuls to the quart) should be cooked three hours, and strained through two thicknesses of cheesecloth. Cream of wheat must be cooked an hour and a half. Hominy grits, soaked over night and cooked two hours. No milk should be used in the preparation of these foods, but they may be cooked with salt.

Medicinal Treatment. The single drug of real value, in the writer's experience, is castor oil. After the initial purgative, a daily dose, too small to be an active purgative, should be given. A mixture of equal parts of olive and castor oil, or a fifty per cent. emulsion of the latter is a useful way of administering this drug. Of these mixtures, one scant teaspoonful at six months and under, a full teaspoonful at twelve months, a little more at eighteen months, and two teaspoonfuls at two years, are the proper doses. The drug should be given ice-cold, and usually in the early morning. The rationale of its action, I do not know; but I feel confident that it exercises a favorable influence upon the disease; lessening the mucus, alleviating the tenesmus, and curtailing the attack.

In older children, a daily dose of sulphate of magnesium (one-half to one dram) is, also, very useful, especially when there is much tenesmus, blood and mucus.

Bismuth is usually administered with the idea of mechanically coating the irritated surface, and for its astringent and antiseptic properties. Forty to sixty grains daily are sufficient for this purpose. I believe it to be of very doubtful efficacy in a genuine, well-marked ileo-colitis. One may administer it for weeks, without the slightest effect upon the number and character of the stools, it not even blackening them. When this occurs, however, it is of value, lessening their frequency materially. For this reason, it has been advised to give sulphur along with the bismuth, for the purpose of blackening the stools; but as this change is due to the fact that the bowel is regaining its natural condition, and not because black sulphide of bismuth is being exhibited, this practice seems to me irrational. This property of bismuth, the blackening of the stools, is of some prognostic import; for with black stools, recovery is often in sight. My practice is to give small doses of this drug (five grains) during the acute stages, and large amounts (ten grains) when it darkens the stools. When bismuth does not have this effect, it is frequently present in the stools in putty-like, white masses, strongly resembling milk-curds—for which, indeed, it is often mistaken;* but from which with care it may readily be distinguished.

The so-called intestinal antiseptics, I have not found of any use. Opium I seldom use, never to lessen the discharges; but if pain is severe, annoying and useless, paregoric is of value (ten to twenty drops, at one year, every fourth hour); or laudanum (three drops in one ounce of hot starch-water, at the same age) thrown high up the rectum, provided that this organ is not too irritable to retain it, as is frequently the case. Morphine is useful when there is great restlessness, and when choleraic symptoms supervene, as occasionally happens. The dose is one-hundreth of a gram, hypodermically. For this condition, bromides are also of value. Cocaine suppositories (one-quarter to one-tenth grain, according to age), if care be taken to insure their retention by compression of the buttocks for three to four minutes, are often successful in allaying tenesmus.

Prostration calls for stimulants, as whiskey or brandy; but for protracted cases, I have found sound port wine better (one dram, three or four times a day). Usually, however, alcohol is unnecessary, save during the initial days, when food is withheld; since even when largely diluted, its routine or prolonged use is liable to cause gastric irritation—a very unfortunate event in an affection wherein diet is so important.

For cardiac weakness, strychnine, digitalis, and camphor are required, as in other diseases.

BATHS. All infants with ileo-colitis should have a daily warm bath, at 95° or 98° both for its cleansing and for its soothing effect, as well as for its influence upon the fever. High fever must be treated with the graduated bath and other approved methods of hydrotherapy.

PAIN. If not relieved by sinapisms, poultices, and carminatives, requires paregoric and laudanum, in the manner already described.

IRRIGATION. This is a mooted question. It has generally been affirmed, because of the localization of the lesion in the large intestine, that irrigations are especially indicated in ileo-colitis. They are supposed to wash out the bacteria and their toxins, and to have a cleansing and healing effect upon the diseased mucosa. They also replace the loss of fluid which the tissues have sustained because of the frequent discharges, although this is not great in ileo-colitis; but I agree with Kerley that it is hardly rational to wash out a bowel that is emptying itself every hour or so. Then the irritability of the gut is often so great that quite frequently the attendants beg that the irrigations be discontinued, because of the increased peristalsis and the local and general distress that they occasion; and as, when such is the case, I have never seen any detriment to the patient from their omission, I seldom employ them in the acute stage and when the movements are frequent. Later, when the stools number five to eight daily, without much straining, and with considerable mucus, they seem to serve a useful purpose. About one quart of saline solution, made astringent with one dram of tannin, should be used daily. Irrigations of cold water (70° or less) are also of value in reducing high temperature, and when a given case exhibits symptoms of toxemia. In subacute or prolonged cases, with excessive mucus, irrigations of silver nitrate (one pint of a 1: 1000 solution, followed by an irrigation of common salt-solution), two or three times a week, are often of service. Colonic irrigation, however, is frequently overdone, prolonging the very condition it is employed to allay. I treat many cases without it.

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*I have known infants to be kept off milk for long periods on this account.

FRESH AIR. This is important. The patient cannot have too much. The sick-room should be large and airy, with wide-open windows, even in winter; draughts being avoided by means of screens, and the body kept warm with hot bottles, if necessary. When practicable, two adjoining rooms should be chosen. In summer, I keep the patients out all day; and night, when it is feasible, *they always sleep on the piazza*.

LOCAL APPLICATIONS. In addition to poultices and sinapisms during the early stages, the constant application of a flannel or wollen binder to the abdomen, together with gentle friction, once or twice daily, with warm camphorated oil, has seemed to me beneficial. The feet shou'd always be kept warm with wollen stockings and warm applications; neglect of this, especially in sub-acute and prolonged cases, often increases the frequency of the bowel-movements.

To sum up, the treatment of ileo-colitis, as described in this paper, embraces:

1. Efficient preliminary purgation with castor oil.
2. The daily administration of castor oil, and sometimes of sulphate of magnesium, in doses too small for active purgation; and, secondary to this, the moderate use of bismuth, as the patient improves.
3. Twenty-four hours of preliminary starvation, water alone being given.
4. The administration of cereal gruels in small quantities, alternating with mild stimulants and water, for three or four days.
5. The early employment of milk and milk-products, the nutrition being thereby conserved, and the recovery hastened.
6. The moderate use of colonic irrigations for specific purposes only, and never as a routine measure; often they are not necessary at all.
7. Special symptoms to be treated along the usual lines, by accepted methods.

THE ETIOLOGY OF ZYMOTIC ENTERITIS.

(Epidemic Diarrhea)

BY

RALPH VINCENT, M. D.

Member of the Royal College of Physicians; Senior Physician to the Infant's Hospital, Westminister.

Zymotic Enteritis is the most fatal disease of infancy, and, despite the advances which sanitation has made in this country, no corresponding improvement is observable in the infant mortality rates. On the contrary, it has been clearly shown by Newman that Epidemic Diarrhea (the official name of the disease) is steadily increasing as a factor in the causation of death among infants under one year of age. He contrasted the death-rates of infancy in the years 1845-1849 with the rates for the years 1899-1903, the figures being derived from the Registrar-General's reports for the two periods. These figures show that the deaths arising from epidemic diarrhoea and from conditions of immaturity at birth have greatly increased:

"Diarrhea, which formerly caused the death of 10 per cent. of dead infants, has increased in half a century to 15 per cent.; respiratory diseases have risen from 16 to 18 per cent.; and prematurity from 17 to 29 per cent. . . . Other children s diseases are vanishing or have vanished. There has been a vast improvement in the general environment surrounding their lives, but the problem of infantile mortality still remains because of the *increase* in these diseases—prematurity, pneumonia, and diarrhea."

The group of conditions broadly indicated by the terms immaturity, prematurity, or congenital defect, are of great importance, for they show that antenatal conditions are responsible for a large proportion of deaths occurring in infancy. These deaths are sharply distinguished from those arising from causes that affect the infant after birth by the fact that the deaths arising from congenital defect occur for the most part in the first few weeks of life, and practically all of them within the first three months.

The great increase in the proportion of deaths caused by "epidemic diarrhea" cannot, however, be so accounted for. The disease may attack the infant at any age, but its greatest intensity of attack is not exercised upon the youngest infants, but upon infants between the ages of four and eight months.

The increase in the proportion of deaths from respiratory diseases is probably closely connected with the increase in diarrhea.

Healthy infants are not very frequently attacked by serious disease of the lung as a primary affection. In a certain number quite young infants a sub-acute bronchitis may be observed. It is very chronic in character, and it is generally stated to have been present at birth or soon afterwards. This is the common type of bronchitis in infants who are born the victims of congenital syphilis.

In conditions of enteritis, pneumonia is extremely likely to develop as a complication. It occasionally occurs in the acute disease, but it is commonly seen accompanying the more chronic conditions. It is a frequent accompaniment or sequela of atrophic enteritis, and many infants suffering from this disease contract pneumonia as a terminal affection.

With regard to zymotic enteritis, it is necessary to lay stress upon the fact that the disease is an extremely acute one and is widely removed in its clinical characters from the chronic digestive derangements from which infants commonly suffer as the result of improper feeding.

The necessity for insisting upon this discrimination is shown by the confusion which exists amongst various writers, and which is well illustrated in a series of cases recently published. Some of the cases appear, from the account, to be clearly cases of zymotic enteritis; others are almost equally clearly not instances of this disease. Indeed, one infant is described as weighing 14½ pounds at five months of age, and as having suffered from epidemic diarrhea *since birth.*

The infants most liable to suffer from the disease in its most violent and fatal form are those in whom alimentary disorders have been established for some time. Their condition is one in which the processes of zymotic enteritis find their unfettered opportunity. In some cases it may be difficult to establish the line of demarcation between the simple and the toxic enteritis; nevertheless, the clinical types are essentially distinct. The disease is so fatal that the consideration of its etiology and of the methods by which it may be prevented is of much greater moment than that of the precise therapeutic measures to be adopted when the infant is attacked. For, with the most expert treatment available, the recovery of the infant is in reality dependent upon the dose of poison the infant has received, the precise degree of virulence of the poison, and the constitutional vigor of the infant.

It therefore becomes necessary to examine the evidence available as to the causation of the disease. Elaborate researches have been carried out by various authorities, with the result that the following facts are clearly established:

The disease is most prevalent and most fatal during the third quarter of the year. The higher the temperature of the late summer, the greater the prevalence of the disease, especially if this high temperature be associated with but little pain. In other words, meteorological conditions involving a high temperature with much dust are those which promote the conditions which accompany the greatest incidence of the disease. Other authorities—notably, Dr. J. T. C. Nash, of Norwich, and Dr. Niven, of Manchester—have drawn attention to the part played by flies in the dissemination of the disease.

The classical researches of Ballard, 1 the more recent researches of Newsholme, 2 and the observations made by many Medical Officers of Health, all establish clearly that the essential factors are high temperature and dust, with special reference to the part they play in the contamination of milk. Three of Newsholme's conclusions are of particular importance:

These facts thus ably elucidated by these observers are incontrovertible, and it becomes necessary to carry our inquiry a step farther, and elucidate, if possible, the precise character of the poison which is responsible for the disease, and the manner in which it is conveyed to the infant.

In the first place, it is essential to the comprehension of the disease that the common conception that it belongs to the group of specific infectious diseases should be abandoned. Zymotic enteritis is in no sense of the word an infectious disease, and it cannot be conveyed by contagion.

The work of the Infants Hospital is confined exclusively to infants under twelve months of age. All the infants when admitted are seriously ill, most of them desperately so. At the times that zymotic enteritis is prevalent very numerous cases are admitted, mostly of an extremely severe type. Since the establishment of the hospital over 1,000 in-patients have been treated. No infant has ever contracted the disease in the hospital. The only infants suffering from zymotic enteritis are those suffering from the disease at the time of admission. No attempt at isolation is made. The infants lie side by side in their cots—the case of severe atrophy next the case of zymotic enteritis—and they are all tended by the same nurses, who minister to all their requirements.

Precisely the same thing is seen outside the hospital. At a time that the disease is sweeping through a town, destroying some hundreds of infants per thousand in the course of a month or two, there are babies living in the most insanitary conditions who are immune. They are the breast-fed babies. There is no need to labor this point, for numerous Medical Officers of Health have drawn attention to the same fact.

Between the circumstances of the poor Irish breast-fed baby living in a London slum and those of the infant warded in the Infants Hospital there is a wide contrast. There is also a remarkable correspondence. Both are fed on a pure *raw* milk. The infants at the hospital are protected by something much more powerful than isolation, for it is a practical impossibility for the violent fatal disease known as zymotic enteritis to occur in an infant fed on fresh milk. It is essential for the development of the disease that the characteristic properties of the natural food of the infant should have been destroyed by heat, by preservatives, or by some other means.

The proper care of milk implies that it shall be handled in such a manner that the development of all organisms in the milk is prevented, whether they be beneficent or otherwise. But even when milk is not guarded so carefully as this, it is protected by its peculiar qualities from decomposition in the ordinary sense of the word. Milk left to itself at ordinary temperatures undergoes a chemical decomposition peculiar to itself. The lactose is converted into lactic acid by means of the lactic acid bacillus, and when the production of the acid has reached a certain point the caseinogen of the milk is coagulated, the action of the acid being exactly the same as regards the precipitation of the curd as that of any other acid—acetic, hydrochloric, etc.

In the case of infants fed on milk that has undergone this lactic decomposition, digestive disturbance is extremely likely to occur and diarrhea is almost certain to ensue. But the affection is altogether different from the conditions seen in zymotic enteritis. (1) The diarrhea is "simple"—*i.e.*, it is due to an excess of a constituent normally present in the alimentary canal; (2) appropriately treated, the infant will soon recover; (3) there is a complete absence of the *toxemia* which is the characteristic and fatal feature of zymotic enteritis.

Such conditions, however, ought to be prevented, and the fact that milk is not in a fit condition for consumption can be readily detected, owing to the characteristic smell of lactic acid, even when this has only been formed in very small amount, so small that it is insufficient to curdle the milk. When the milk has not been cooked there is therefore a natural danger-signal, indicating that it is not sufficiently fresh.

The fundamental character of this reaction is that it entirely prevents any changes occurring in milk of a poisonous character. Moreover, the production of lactic acid is by no means unlimited. When the amount of acid produced has reached a certain point (considerably less than one per cent.), the lactic bacilli are inhibited, and thus a condition is reached in which no further development of lactic organisms can occur, while no other organisms can develop, since these require an alkaline or neutral medium.

The organisms which are responsible for the production of zymotic enteritis are universally distributed. They exist in the mouth of every healthy infant. They are the ordinary organisms of putrefaction, but they cannot attack milk in its natural state.

For the incidence of zymotic enteritis certain general conditions must obtain:

1. The milk must be boiled (pasteurized or sterilized), or so treated by heat, or by preservatives, or by some other means, that the lactic organisms are either destroyed, or their action inhibited.

2. The milk must then be subjected to conditions which allow of a development and culture of the putrefactive organisms.

Since the condition of the milk with regard to the lactic organisms is the essential point, the other means by which their action may be prevented require to be mentioned. When the milk mixture prepared for an infant is made from raw milk, the mixture may comply to a greater or less extent with the specified conditions in certain circumstances. In the preparation of the food of the young infant, cow's milk is considerably diluted, equal parts of milk and barley-water, supplemented by a little cane sugar, being a common mixture. If this mixture is made in bulk from boiled milk, and is allowed to stand for some consider-

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The following experiment was carried out by Revis and Payne:

Two litres of milk obtained under very careful conditions were inoculated immediately after milking with a coagulated milk cuture of *B. acidi lactici*. The milk was kept at 65° to 67° F.

The percentage of lactic acid formed (in grammes per 100 c.c.) was as follows: 24 hours, 0 0230; 48 hours, 0 0710; 72 hours, 0 1285; 96 hours, 0 2725.

able time, the danger in hot and dusty weather is extreme. But even when made from raw milk the danger is always present, for the growth of the lactic organism depends upon the presence of lactose; in the diluted mixture the amount of lactose is much reduced, and consequently the production of lactic acid is much diminished; while the barley-water and the cane-sugar directly favor the organisms dangerous to the infant. Apart from the above treatment, nearly all methods commonly employed in the domestic preparation of the infant's food favor the development of putrefactive organisms. The addition of an alkali, such as lime-water, hinders the protective action of the lactic bacilli, for the alkali neutralizes the acid to a greater or less degree. Other factors not directly concerned with the handling of the milk prior to administration predispose to the disease. Many infants suffer seriously from chronic indigestion, in consequence of the mass of cases in which their gastric and intestinal secretions have to deal with. Even in such a commonly used mixture as equal parts of milk and water, the casein is present in a proportion about three times as great as in the food received by the healthy infant when breast-fed. As a result of this excess, the normal fermentations are greatly hindered. The bacilli common to the large intestine become more and more established in the small intestine. The intestinal dejections in consequence give evidence of putrefactive changes. These are pre-eminently the conditions predisposing to the incidence of the disease.

Diluted condensed milk of the ordinary variety is probably the agent responsible for the disease in its most fatal and devastating form. Here, every condition has been fulfilled that the putrefactive organisms may acquire their fullest activity. The condensed milk when diluted contains so minute an amount of lactose as to render it a negligible quantity. The lactic organisms have been entirely destroyed, and putrefactive changes are the only changes that can occur.

Boiled milk is, however, the type of the food commonly used and fulfilling the conditions for the development of the disease, and it is necessary to consider the actual resultant processes as they affect the infant belonging to the mother of the poorer classes.

Owing to certain physical peculiarities of milk, it is practically an impossibility for the mother to raise milk to a temperature of 212° F. At about 190° F. it "scalds" or boils over, and it is at about this temperature that the milk is removed from the fire. No more effectual means could be devised to promote the development of the conditions responsible for the incidence of zymotic enteritis. The boiling effectually destroys the lactic organisms but it makes no impression on the spores of the putrefying bacteria. Much higher temperatures and much longer exposure are required to kill these. It is the condition of the milk *after* the boiling that constitutes the critical and imminent danger to the infant. Even if the mother carefully employs the only method of cooling at all available to her, she has to reduce the temperature of a fluid at about 190° F. by means of running water, which as it comes from the tap, in the summer, is at a temperature of about 70° F. This latter temperature is nearly the *optimum* temperature for the putrefactive organisms, so that their prolific and luxuriant growth inevitably ensues. In the process of transferring the milk from the saucepan to a jug or other vessel in which the milk is to be kept occurs the first contamination after boiling. The mother may cover the milk with a saucer or by some other domestic means, but it is practically certain that dust will find its way to the milk, when the circumstances of the poor home are considered. Moreover, the frequent intervals of the infant is that it is a raw fluid. In all circumstances the cooking of milk for the use of infants gravely impairs its nutritive value. With regard to zymotic enteritis, no serious amelioration in the mortality arising from this disease can be anticipated until the fullest protection of pure raw milk is secured for every infant, and special precautions must be taken, at times when heat and dust are prevalent, to secure that the milk for the use of infants shall be preserved fresh and unboiled.

1, Harley Street, London, W.

The Assiciation of American Teachers of Diseases of Children will hold their fourth annual meeting at the Southern Hotel, June 6th, St. Louis, Mo. An unusually interesting and attractive program is in preparation and from all indications the meeting will be a most interesting session.

*FEEDING IN THE SECOND YEAR.

BY

J. ROSS SNYDER, M. D.

Pediatrist to St. Vincent's Hospital, Birmingham, Ala.

Digestive disorders and disturbances of serious nature occur more frequently among children between twelve and twenty-four months old than among younger infants. At first glance this may be regarded as being due to the fact that the majority of young infants enjoy an immunity and protection that accompany only breast milk feeding. However, after making the comparison in several different ways, it will be seen at once that this alone will not account for the increase in digestive ills in the second year.

For instance, th's increase will be found to occur when the comparison is limited to babies fed artificially from birth or shortly thereafter. Again it will be found if the comparison is made with, on the one hand, babies in their first year that are being artificially fed and on the other, babies in the second year that were nursed the first twelve months.

This comparison does not include hospital cases, which would no doubt considerably modify the ratio among artificially fed babies. It represents fairly well what occurs in private practice, at least, what occurs in my own practice and in the practice of a number of my confreres, whom I have consulted on the subject. The fact is then, that the majority of young infants, being breast fed, enjoy a certain amount of immunity, only partially explains the increase in digestive disorders among children in the second year. Indeed the more developed digestive apparatus at this later period ought to a considerable degree, to even up the chances of sickness. Even granting it to be a factor, teething cannot account for it. Neither weaning, nor teething, nor season will explain it.

Personally, I am convinced that the vast majority of cases of digestive disorders occurring in the second year of life, are, for the want of a more emphatic term,—unnecessay. I purposely do not apply the term preventable to these cases. To do so would imply that active measures in opposition must be instituted to overcome them, while the truth is that for the most part these disorders are actually coaxed on the part of parents—and some doctors, by an utter abandonment of regard for the baby's digestive capacity and capability. To call these ills preventable would not be descriptive. One can prevent his baby from falling into the fire, but one is entitled to no claim of preventing his child from being burned simply because he refrains from making his baby jump over fires. However, if I were to describe this class of cases with suitable adjectives, I would be compelled to go beyond the limits of the Christian vocabulary. Unhappy though it makes me, I must let them go as they stand!

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*Read before the Southern Medical Association, at New Orleans, La., Nov. 9th 10 and 11th, 1909.

If the baby is breast-fed, the mother, probably long before the end of the twelfth month, has been taking him to the table and allowing him a bite of this and a bite of that of adult food. So that by the time the baby enters his second year, his stomach is receiving much that is unfit.

If the baby has been artificially fed, and provided he has passed a not too eventful career, parents in many instances do not see the necessity for continuing his diet under a physician's supervision after the twelfth month. Soon after the physician's presence is removed, the mother becomes lax and indulgent, and with too great haste an increasing amount of solid food is added to the baby's allowance.

The digestive apparatus now being more developed is less sensitive than in earlier infancy. During the tenderer age, any indiscretion in diet was immediately followed by imperative symptoms. Vomiting, purging, fever and convulsions, one and sometimes all, at once gave warning to desist and to find the cause. No such symptoms arising now, parents may for a long time continue to stuff the child with all kinds of indigestibles without an awakening to their offense. Sooner or later, however, ill effects ensue—and marked. These show themselves in various ways. Sometimes they are accumulative and explosive. More often they come on so insidiously that it is only after weeks or months that the mother awakens to the fact that something of a serious nature is the matter. The dimples, the plumpness, the pinkness and the sweet disposition have vanished—the baby is now anemic, puny and peevish.

If the mother is wise, she takes the child at once to a physician. If the latter is wise, he puts a stop at once to all foolishness and institutes a rigidness in diet that embraces simplicity, saneness and safety. If the doctor is otherwise, he will content himself, satisfy the mother, and endanger the baby with a diagnosis of "teething" or of "worms."

Too many students and practitioners get their ideas of a subject's importance only from the amount of space allotted to it in the text books.

The feeding of young infants is a very complicated problem and its various methods are still open to dispute. Authors, therefore, are compelled to devote more space to its discussion than to that which is simpler and about which pediatricians as a rule are agreed.

But to the child, at least, it is just as important that he be fed sensibly in the second year as it was to be fed scientifically in the first year.

Again, although the problem of feeding at this age is more simple, these children can no more be fed alike than they can be so fed in earlier babyhood. Babies must be regarded and treated as individuals. More individual even than his soul, is a child's digestion. Around it center all his thoughts, all his words, and all his actions. It furnishes him his work and his play; his study and his recreation—even his religion and his blasphemy! All his goodness, all his cuteness depend on it. So too, all his badness, all his sadness —and sometimes a fit. Seriously, there is no exaggeration in the assertion that between babies there is no difference except that which is conferred by digestion—and possibly color.

Any one who sticks to formulae or who follows fixed rules in infant feeding will not obtain satisfactory results. Previous history in relation to illness and method of feeding; the number of teeth; the weight; the degree of robustness, etc., are of even more importance than age in determining the kind and the amount of food suitable for a given baby; notwithstanding the importance and concern which the lay mind attaches to talking and walking, the dimensions of a baby determine its development rather than its accomplishments.

The weight of the average normally developed child at the end of the first twelve months is nearly twenty pounds. In the next twelve months there should be a gain of about ten pounds. The height at twelve months should be between twenty-nine and thirty inches. The stature should increase by three inches during the next year. When a year old, the baby should have between ten and twelve teeth. When two years old, sixteen to eighteen teeth should be showing. The stomach's capacity in the year old infant is a scant nine ounces and increases but slowly during the next year. The amylolytic function of digestion is almost fully developed by the end of the first year. By virtue of existence alone, we know a function creates a demand which can not with impuntiy be left unsatisfied.

It is only by keeping these things in mind that one is enabled to arrive at a rational index for feeding the individual child in the second year. The diet to be outlined below, therefore, must be considered only suitable for the average child.

If weaning has not already taken place by the end of the twelfth month, this process, provided there are no contra-indications, should now be begun with the substitution at first of but a single bottle feeding for one of the nursings. By a gradual addition of bottles, the process should be completed as rapidly as possible and yet in such a way as to permit digestion to adjust itself to new requirements. In the normally developed infant of twelve months, the indications are for a higher fat, sugar and proteid percentage in the food. If the baby has been weaned or if fed on modified starch, some kind of starch may be added to the milk as early as the ninth or tenth month. In determining what form of starch to use, it is well to remember that oatmeal contains more fat and proteid than any other. The amount of starch allowed at first should be small, and as it is increased, the amount of sugar that is added should be reduced, and later, entirely left out.

The increased demand for proteid and fat can be met at first by giving whole milk and then by the addition of beef-juice, scraped beef, broths and eggs to the diet. Between the twelfth and the fifteenth month, the child should receive five feedings per day: first feeding to be given between 6:30 A. M. and 7 A. M.; second feeding between 10:30 and 11 A. M.; third feeding between 1:30 and 2 P. M.; fourth feeding between 5:30 and 6 P. M.; fifth feeding between 9:30 and 10 P. M. All meals should be given at regular hours and nothing between. Strained orange juice, however, should be given between the first and second feedings in the morning

For the early morning feeding, one to two tablespoonfuls of oat meal gruel or jelly in eight ounces of whole milk may be given.

The second feeding should at first consist of a piece of brown toast or zwiebach, and a half pint of milk. A little later the white of a soft boiled egg, or the yellow of a very hard boiled egg may be given. Still later a teaspoonful or two of scraped rare beef mixed with stale bread crumbs may be alternated with the egg.

For the third feeding, strained mutton, chicken or beef broth, at first approximately fat-free, and thickened with cereals, may be given, 2 to 4 ozs.; and 6 to 8 ozs. of whole milk.

The fourth feeding should consist of a piece of toast or a crust of stale bread and half a pint of milk to which 1 oz. of some cereal jelly has been added.

At the fifth feeding, milk only should be given.

Between the fifteenth and eighteenth months four feedings should be given in the day. Well cooked rice, cream of wheat, plain rice pudding, stewed prunes mashed through a sieve, baked sweet potatoes and apple sauce may now be added to the diet list. One of these, not all, should be served with the early afternoon feeding. At this feeding, no milk, but broth, should be given.

Between the eighteenth and twenty-first months, the baby should still get four meals. 7 A. M., a soft boiled egg, grits, oatmeal, or cream of wheat Cereals should be cooked the night before, kept on ice and heated over, otherwise there will not be sufficient time to get them done in the rush of the morning. These cereals may be served with equal parts of milk and cream, and a little sugar. Eggs, if served oftener than three times a week, will become distaseful. Milk and a piece of buttered stale bread or toast complete this meal. 11 A. M., instead of scraped beef, the tender part of a lamb chop or a small piece of thin crisp breakfast bacon may be given. Spinach, asparagus tops, strained stewed tomato or celery are other articles that may now be tried. A drink of milk, sweet or fresh buttermilk, a piece of cold egg bread or corn muffin, completes this meal. 3 P. M., a cup of strained pot liquor and toast may be given instead of meat broth. Otherwise meals should be the same as between the fifteenth and eighteenth months. Until the end of the second year the last feeding of the day should consist of nothing but cereal jelly, milk and stale bread.

I have made no attempt to fix the diet for the children. I have only attempted to limit their diet within boundaries, not guaranteeing safety, but beyond which I believe it is hazardous to go, except upon definite incidations.

Unless history belies itself, some there will be who will attempt to discredit and probably ridicule my paper, by reciting cases in which articles of diet not embraced in my list, were eaten freely and digested by babies with no ill effects.

It is true that the alimentary tract of the baby will sometimes stand a deal of abuse. I have seen a six months old baby eat for its supper, and without any apparent ill effects, a saucer of chicken pie, a piece of undone cake and a slice of watermelon. I have seen many seemingly healthy babies not yet past the second year, eat such indigestible stuff as pork chops, sausage, stewed corn, cabbage, batter cakes, fried potatoes, hash, etc. I have also known children, who on repeated occasions indulged with seeming impunity on such luxuries as tacks, needles, nails, pins, marbles, pennies, screws, etc. By none of these gastronomic feats am I convinced that I should include these articles in the dietary of children over whom I have supervision.

*MENTAL DEFICIENCY IN CHILDREN

BY

JAMES DUNDAS, M. B., D. P. H.
Assistant Medical Officer, Kent County, Eng.

This subject has lately become of greater interest to the profession as a result of the medical inspection of school children.

In the past the existence of the village idiot was taken as a matter of course. He was pitied, philanthropy provided for him, more or less—usually less—his acts were condoned, but beyond that no interest was taken in him. He was not regarded as a member of a large class, as an expense to the community, and one of the chief sources of our goal and workhouse population.

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*The "Practitioner."

In recent years these facts have been gradually recognized, and we have now in the Defective and Epileptic Children Act and in school medical inspection means of tackling the problem. It has been estimated that there are 50,000 mentally defective children in the elementary schools of England and Wales. When these figures are pondered, when it is realized that these children are incapable of benefiting by instruction in elementary schools, are a drag on the rest of the class (on the principle that the speed of the fleet is that of the slowest ship) and a danger to the community, the gravity of the situation comes home to one.

Most men coming to this work have probably seen very little of these cases, for, indeed, they seldom appear in the hospitals, nor are they the kind of cases "final" men expect to meet. This paper is intended to lay down some broad lines for the guidance of these men.

Mental deficients are legally defined as children "who not being imbecile and not being merely dull and backward are defective, that is to say, by reason of physical and mental defect are incapable of receiving proper benefit from the instruction in the ordinary public elementary schools, but are not incapable, by reason of such defect of receiving benefit from instruction in such special classes or schools as are in this Act mentioned."

Imbeciles are "those persons who by reason of mental defect existing from birth or from an early age are incapable of earning their own living, but are capable of guarding themselves against common physical dangers."

An idiot is a "person so deeply defective in mind from birth, or from an early age, that he is unable to guard himself against common physical dangers."

These, then, are the three great classes of mental cases that one meets with in children, and the task of properly differentiating them is by no means easy. There is a group, probably as large as these three combined, and which may be labelled "backwards," which provides the chief difficulty. The first question one asks then in seeing a case is: Is this merely a "backward," or it it a mental deficient, using the term for the moment as applying to the three classes "mental deficients," "imbeciles" and "idiots"? This is a question of prime importance. Special schools are intended for deficients, not "backwards," and further, children entering these schools are retained till the age of sixteen. In addition, to label a "backward" as a mental deficient is doing gross injustice to a child. It places a permanent stigma upon him.

The ætiological factors of backwardness may be considered here. The parents are often casual laborers, persons of no fixed abode and vagrant habits. They are often unemployed, or even unemployable. The children are frequently illegitimate, the progeny of a brothel. They are badly clad, badly fed, and filthy. Regular habits and attendance at school are not enjoined, the latter, indeed, is often evaded. It is possible, then, to get a child of ten, eleven, or even twelve, of this type incapable of doing infant-room work, though, on account of his size, he may have been passed up into the mixed school. He may not know his own age, fails at the simplest arithmetical questions, and can read only the shortest words. His attention is bad, his manners vicious, and his whole aspect one of dulness and mental vacuity. Off hand, such a child is labelled as a mental deficient, which may be far from being the case. The truth is, certain of his nervous tissues are uneducated and unused, but there is no lesion interrupting his association fibres. On the other hand, he may be far down in the scale of "backwards," on the borderland of deficiency. He may be unable to learn to read or write with any proficiency, or profit much by education in the ordinary sense of the term. Still, according to Tredgold, "If, in spite of his mental dulness, he seems intelligent enough to follow an occupation, and to look after his interests with ordinary prudence, then he is not defective." Such cases often find their way into special schools for mental deficients and show marked improvement, so much so that they resume their places successfully in the ordinary schools. The true mental deficient does not do this. His condition is incurable. The treatment of backwardness is obvious. An improved environment is often sufficient, with skilled teaching according to their condition. Fortunately the new Children's Act gives power to remove children from unsatisfactory surroundings and guardians. Undoubtedly many of this type, under the care of institutions like Barnardo's Homes or the Salvation Army, have become useful citizens and colonists.

In considering the differential diagnosis, we are mainly concerned with the borderland cases, the slight degrees of deficiency, and the grave degrees of backwardness. The differentiation of these three degrees of deficiency is not so important for the officer at work in a school. The main features of the deficient child will now be touched on.

On inspection one notes short stature, which is coupled with subnormal weight. There are certain obvious and frequently present deformities, of the cranium, micro-, or macro-, cephaly, or the sugar-loaf type; large, flabby, protruding, or small and imperfect ears; squint and high-arched palate. A "stand easy" attitude is adopted; the child is listless and dull, possibly ignores his inspector, and his attention is with difficulty obtained and retained. Or he may display a monkey-like activity, cunning, and suspicion. His mother gives a history of late dentition, that he did not walk till he was four, nor speak till he was five or six, that he suffers from cold hands and feet, and frequent indigestion. His teacher will tell of dirty habits, of cunning and deceit, of fierce outbreaks of temper and murderous attacks on his fellows, showing a serious loss of any sense of right and wrong.

The next step is to endeavor to estimate his mental attainments and possibilities, and little can be done here unless one gains the child's confidence, or at least does not induce his antipathy. Try him with simple calculations, try his reading powers, show him a picture in his reading book and get him to tell what he sees there. In this way it will be found that his attention wanders on the slightest provocation, and that he is very unstable and readily moved to tears, anger or laughter. His speech is halting and often monosyllabic. He has little sense of the beautiful or of reason, and is devoid of ideas. In this fashion one secures data to decide whether he is incapable of receiving benefit from instruction in an ordinary school, and whether he has intelligence enough to follow an occupation, or look after his affairs—in short, whether he is deficient or not.

The above description applies to the large majority of cases. They are the progeny of insane, epileptic, alcoholic, and tuberculous parents. There is a distinct hereditary taint about them. Their condition is congenital, and dates from birth. There remains, however, a small group not so originated. Their deficiency, or amentia, in its varying degrees, is acquired. They suffer either from some anatomical brain lesion, or the necessary trophic stimuli, *viâ* the blood and nerves, are imperfect, or missing, a condition analogous to the changes induced in a limb or organ whose blood or nerve supply, or both, is interfered with. As regards the anatomical brain lesions, epilepsy, the zymotic fevers, and intra-cranial inflammation are the causes. Pathologically, sclerosed patches, cerebral softening, cystic areas, etc., are formed, and, clinically, the signs correspond to the site of the lesion.

Possibly more interesting are the cases due to absence of adequate circulatory and nervous nutriment. Cretinism is the outstanding example of the first of these, though cretins can hardly be classified among the less severe grades of mental deficiency. The thyroid secretion, distributed by the blood-stream, is absent, and impaired nutrition throughout the body results. In common with the rest of the body brain development is retarded or inhibited. As these cases usually begin early, under one year of age, mental development is lacking from a very early stage. These cases are therefore true samples of amentia. The appearance of the child suffices for diagnosis. The face is large, pale and sallow. The eyelids are puffy, the nose thick and flattended. The abdomen is prominent. The figure is squat, the legs short and the walk is characteristic. Fortunately in the exhibition of thyroid extract we have now the means of coping with these cases—a most glorious and remarkable triumph for therapeusis.

There remains the important group due to lack of nervous nutrition, the lack of sensory stimuli—a group for which the school medical officer should keep a careful look-out. In the past many of these cases, through lack of early recognition, have found their way into asylums for the insane. Through sheer mental starvation brain atrophy or amentia has been the result. In other words these are cases of permanent mental disablement in which one or other of the great afferent tracts is out of action. In consequence they suffer from a bankruptcy of ideas, which, maintained for a time, becomes a condition of permanent mindlessness. Educated and mentally fed through the remaining afferent routes deterioration is prevented. Indeed we may say that amentia in this type of case is preventable.

Take the case of the deaf-mute. He does not hear, therefore he does not learn to speak. All the vast array of stimuli through the ear are lost to him; he lacks the help of his auditory centre and the reproduction of sounds through his motor-speech mechanism is too much for him. So true is this that should a child of five or six become deaf he will become dumb. These children are only potential aments. Caught early and trained in a deaf and dumb school the brain quickly expands and takes on its normal function. A large number of dumb children belongs to this class. They are distinct from the dumbness one finds in the idiot who is dumb because he has nothing to say, and the aphasic idiot who has a motor mechanism lesion.

Such cases, then, are illustrations of amentia from lack of mental impressions. A living illustration of what these cases may become is Helen Keller, the American lady, who suffered in this way and has given us most illuminating accounts of her own mental development under careful instruction.

Closely allied to these cases are the word-deaf cases. They hear sounds and words but interpretation of them is impossible. Speech to them is a mere jargon. They differ from the adult aphasic. His condition is one of retrogression. He has usually some auditory memories left, and his motor-speech centre has been trained and is sound, not so the word-deaf child.

To test these cases is no mean task for the medical inspector. The functions of the various speech, auditory and visual centres and their connecting fibres must be tested individually and in combination. First of all, the existence of other conditions, such as deafness and blindness, must be excluded.

It is well to begin with the auditory centre. If it is healthy the child will hear and understand what is said to him. If he speaks his motor-speech centre is sound, and if he replies to a question the fibres linking up his auditory and motor centres are intact. The message to the ear has been received and interpreted at the auditory centre, flashed to the motor-speech centre and thence out to the musculature. Various lesions may interrupt these communications. Thus, if the break is at the auditory centre word-deafness is the result; if between the auditory and motor centres the patient cannot reply to the words spoken though his power of speech still remains to him. A lesion peripheral to the speech centre implies loss of power of articulation. In the last two cases he knows what he wants to say but cannot say it.

Then comes the visual centre. In the child of school age the message travels from the eye to the visual and thence to the auditory centre before being transmitted to the speech centre. A lesion at the visual centre means word-blindness, and the child cannot read. A lesion on the commissural fibres between the visual and auditory centres would prevent the child reading aloud. It should be pointed out, that it is only in educated adults, strong "visuals," where reading can be performed independently of the auditory centre.

These points can be tested by speaking to the child, first to see whether he understands, and then to obtain a proper response. Similarly, the capacity to pick out words and name them demonstrates the integrity of the visual-auditory-motor arc.

There remain the interesting lesions affecting writing. This is controlled by the motor-speech centre and the centres for the muscles of the hand, a combination of Broca's convolution with the neighboring motor centres. In addition the auditory and visual come into play and they may be tested on the lines already laid down.

OBSTETRICAL ACCIDENTS CAUSING MENTALLY DEFECTIVE CHILDREN.*

BY

EDWARD P. DAVIS, A. M., M. D.†
Philadelphia.

We may consider this subject under first, the accidents of pregnancy; second, the accidents of labor.

Experiments show that continuous or violent disturbance of an impregnated ovum results in malformation and the production of monstrosities. Maternal impressions from fright or physical violence are undoubtedly followed by the birth of individuals malformed, and in many respects with altered minds. The coincidence is too widely observed to admit of doubt, but the precise manner in which the effect is produced is not clearly demonstrated. Sufficient is known to make it of the utmost importance that the pregnant woman be not subjected, in the interest of her offspring, to sudden or violent mechanical force or to great nervous shock.

Great disturbance in maternal metabolism may result in the birth of malformed and defective children. Mal-nutrition in the mother is followed by intrauterine rickets, hydrocephalus, and other lesions.

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*Read before the Philadelphia Pediatric Society, March 22, 1910.

†Professor of Obstetrics in the Jefferson Medical College and the Philadelphia Polyclinic; Member of the American Pediatric Society.

Hereditary peculiarities of metabolism may also influence the development of the fetus. Such are, hereditary hare-lip and cleft-palate, which affect not only the anatomy of the fetus but interfere with the mental development of the child. Disturbances in fetal metabolism may also result in the production of defective offspring. Amniotic dropsy producing polyhydramnios and fetal dropsy, are a familiar example.

Toxemia from the absorption of intracellular placental ferments producing multiple thrombosis and embolism may threaten the mother's life and seriously endanger her offspring. Children born during maternal eclampsia, if they survive toxemia, may themselves perish from eclampsia, or suffer permanent injury to the nervous system.

Race degeneration from alcoholism and syphilis, furnish familiar examples of the birth of deficient offspring.

Acute infections attacking the mother may seriously damage the nervous system of the fetus. The writer recalls the case of a vigorous woman who became the mother of several unusually well developed and intelligent children. In one pregnancy she suffered a severe typhoid infection accompanied by high fever and hemorrhages. Her child, a girl, was born with a permanently damaged nervous system. Although now a grown woman, she is hemiplegic with disordered speech. Her mentality and disposition seem normal, and education and good hygiene have enabled her largely to overcome the defects of birth; but during her younger life she was greatly crippled, and regained useful health with great difficulty.

Acute gonorrheal infection in the mother may be transmitted to the fetus in utero, producing ophthalmia, which may lead to blindness. Impairment of the sense of sight may seriously impair mental development in children.

The accidents of labor affect the fetus through birth pressure and asphyxia. Birth pressure may injure the brain directly through pressure upon the cranium, and secondarily through pressure upon the viscera. Cranial pressure results from long continued labor, with premature escape of the amniotic liquid.

In normal labor the fetal cranium is subjected to lateral pressure, causing a diminution in the transverse diameters, and elongation of the depth of the fetal head. This enables the brain to accommodate itself to normal birth pressure, the retrocession of the crebral fluid into the spinal meninges preventing serious cerebral pressure. In long continued labor the physiological limit is exceeded, the cerebrum becomes excessively compressed, and multiple hemorrhages into the cerebral centres follow.

When disproportion in size between mother and fetus exists, birth pressure becomes more prononuced and dangerous. In these cases the head is excessively drawn out, and if the pelvis be malformed, pressure is exerted unequally upon the parietal portion of the fetal head by the promontory of the maternal sacrum, resulting in injury to the middle meningeal artery and its branches. Abnormal presentations, as brow presentation, may result in serious pressure upon the cerebral convolutions. In face presentation, the face may be severely bruised but the cerebral hemispheres often escape. Precipitate labor unattended, may cause cerebral injury to the fetus through impact with the floor or surrounding objects as the fetus falls from the body of the mother.

Ill-chosen and badly performed obstetric operations often result in cerebral injury. The application of the forceps to the fetal head before the head has engaged and moulded and the fetal cerebrum has accommodated itself to the altered shape of the cranium, is a frequent cause of injury. Applications of the forceps over the face and occiput, and obliquely over the head, are also dangerous. Version and extraction through contracted pelvis, or partially dilated birth canal, often results in cerebral injury.

The pathology of cranial injury in labor consists in fracture of the cranial bones with bruising and laceration of the meninges, laceration of vessels, bleeding, the formation of clots, with pressure upon cerebral centres. In cases not promptly relieved by treatment, should the fetus survive, the pressure of the clot may cause softening and permanent damage to cerebral tissues.

In abnormal labor, where the position of the fetal arms becomes abnormal, or excessive torsion upon the neck occurs, injury to the axillary plexus may develop accompanied by rupture of nerve fibres, and the subsequent development of paresis and paralysis.

Birth pressure may also damage the fetus by producing visceral apoplexies. Severe and continued pressure upon the thorax, with efforts at respiration, may result in the extravasation of blood into the lungs and the formation of thrombi and emboli, which may be carried to the cerebral substance. Severe pressure upon the abdomen may be followed by hemorrhages into the liver.

In difficult delivery with disproportion, the eyes may be subjected to such injury that the anterior chamber of the eye may be ruptured, and partial or total blindness result.

Asphyxia during labor occurs when pressure upon the umbilical cord interferes with the passage of oxygenated blood to the fetus. Involuntary respiratory movements result, over-distending the right heart and favoring the occurrence of cerebral hemorrhage.

In cranial fractures with depression of the bone occurring during birth, the patient should be subjected to operation, and the depressed bone elevated without anesthesia so soon as possible. In injury to the axillary plexus, the injured nerve trunks should be resected and the newly cut ends untited so soon as the child is able to take an anesthetic.

Strict enforcement of the proper hygiene of pregnancy will protect the fetus from the accidents which threaten its intrauterine existence. Clinical experience and a better knowledge of pathological chemistry enables us to detect maternal and fetal toxemia before eclampsia results, and to save the lives of mothers and children. Pregnant women attacked with acute infections should be treated for the existing infection, care being taken to reduce the maternal temperature below 104° F., by all safe and reliable means. The use of vaccines promises well in these conditions.

The prevention of alcoholism, syphilis, and gonorrhea, is obviously important.

Pelvimetry and the study of the relative size of mother and fetus enable the obstetrician to diagnosticate disproportion. If the induction of labor be selected, care must be exercised that vaginal delivery is not undertaken until the fetal head has engaged and moulded and complete dilatation of the birth canal has been secured. It must be remembered that the interruption of pregnancy exposes the fetus to greater danger than delivery by other methods at full term.

In complicated labor the fetus as well as the mother should have the benefit of modern surgery. If moulding and engagement be present, the birth canal distensible, and the transverse diameter of the pelvis at its outlet be sufficiently large, the forceps may be applied to the sides of the fetal head under anesthesia and delivery effected by axis traction. Used under these conditions, the proper employment of the obstetric forceps saves the lives of mothers and children, and prevents cerebral injury. Version and extraction must not be undertaken in the interests of the fetus unless disproportion be absent, and through dilatation of the birth canal secured. In this operation, care must be exercised to prevent asphyxia and premature respiration.

In moderate disproportion pubiotomy will save the lives and nervous systems of many children, with a moderate risk to the mother.

To save the life of the fetus, and to avoid injury to the cerebrum by pressure and by asphyxia, delivery by abdominal section stands pre-eminent among the operations of obstetric surgery. Under no circumstances should this be undertaken unless the child is in good condition. Where mother and child are the victims of septic infection abdominal section with the removal of the uterus will sometimes save the lives of both.

Essential improvement in fetal mortality and morbidity is one of the most striking results of the devolopment of modern obstetric surgery. Still further improvement can only be obtained by applying to all complicated labors the principles and practice of modern surgical technique.

SOCIETY TRANSACTIONS

Philadelphia Pediatric Society.

November Meeting, 1909,

J. CLAXTON GITTINGS, M. D., in the Chair.

SYMPOSIUM ON SCARLET FEVER

Aetiology of Scarlet Fever.—Dr. Alfred Hand, Jun., gave a brief historical sketch of scarlet fever, quoting a description of the disease from Smetius (1611), who, however, did not name it. Sydenham (1624-1689) being the first to differentiate it from measles and smallpox, and to name it *febr s scarlatina.* Charts were exhibited giving some statistics for Philadephia, one showing that the monthly number of cases bears a close relationship to the school-term, July, August, and September having about 100 cases each, while from October to June the number ranges from 200 to over 300 a month. Another chart showed that there is a lowering in the incidence of the disease during the last five years as compared with the four years preceding, but that there has been an increase in the mortality from 2.9 per cent. in 1905 to 5.2 per cent. in 1907. A third chart showed the annual fluctuations in the actual number of deaths since 1862; this also illustrating the variations in severity of different epidemics; the highest points were reached in 1870 and 1875 with 956 and 1032 deaths respectively, while 1872 had only 174 deaths in comparison; 1896 had 61 and 1897 had 282 deaths, the lowest number of all being reached in 1905 with 57 deaths.

While some investigators believe that a streptococcus is the exciting cause this belief is not yet generally accepted, and it is of great importance to have this point settled. When the specific cause is discovered beyond doubt it will clear up many strange features of the disease as to its modes of travel and, perhaps, as to the variations in susceptibility to it, and in the mortality in different epidemics; but it will be of the greatest help in diagnosing the mild and atypical cases.

The Municipal Control of Scarlet Fever.—Dr. Maurice Ostheimer read this paper, explaining the regulations of the Philadelphia Board of Health in preventing the spread of scarlet fever. Post-cards are distributed on which the physician is required to report each case as soon as diagnosis is made. On receipt of this card a medical inspector is sent to the home of the patient to place placards on front and back entrances, and to see that the patient be properly isolated. No case of scarlet fever is allowed to remain on the first floor of the ordinary Philadelphia house. If not properly isolated, with trained nurse or other competent woman, who remains in the sick-room with the patient, the premises are placed under police quarantine, an officer being stationed front and back, allowing no one to enter or leave. No empty milk bottles are permitted to leave the house until disinfected. Wage-earners are allowed to move to homes in which there are no young children, after taking a carbolic bath and having their clothing disinfected. Children are excluded from school and Sunday school so long as the house remains placarded. The sanitary condition of the premises is inspected, and unvaccinated individuals are urged to submit to vaccination. All inmates of houses in which scarlet fever exists are prohibited from working in any establishment for the manufacture or sale of wearing apparel, upholstery, house-furnishings, bedding, cigars, cigarettes, or food-stuffs. The medical inspector notifies employers of scarlet fever occurring on the families of their employees; he excludes employees from work and permits their return after removal and disinfection. A sterilized gown is left at each house by the Board of Health for the attending physician to wear when visiting his patient.

The medical inspector also sends a post-card to the attending physician on the day he placards the premises, which the attending physician returns to the Board of Health when the case is ready for disinfection. On receipt of this card the medical inspector visits the house, sees the patient, and if satisfied that desquamation is over and that there is no discharge from nose or ears, he orders disinfection with removal of the placards on the next day, provided that at least twenty-one days have elapsed from the onset of the disease. He then sends school children back to school and notifies milkmen that milk bottles have been disinfected.

If isolation should be impossible at home, the patient is removed to the Municipal Hospital for Contagious Diseases. A telephone call will bring the ambulance at once. Disinfection of the premises follows one day after removal of the patient to the hospital, but school children are excluded for a week at least. The diagnosticians of the Board of Health are always ready to see any doubtful case and to make the diagnosis.

Difficulties in the Diagnosis of Scarlet Fever.—Dr. Jay F. Schamberg discussed various difficulties in the diagnosis of scarlet fever. He believed that more errors of diagnosis were made in connection with this disease than with any other acute infection. In formulating the diagnosis undue weight should not be given to any one symptom; all of the associated phenomena should be carefully considered. Dr. Schamberg regarded the coincidence of a distinct angina and a well-pronounced scarlatinoid rash as not only warranting the diagnosis of scarlet fever, but, in view of our duty to the public health interests, this association compels us to regard and treat such cases as scarlet fever. He strongly counselled against the administration, to patients suffering from tonsillitis, of any drugs capable of producing a scarlatinoid erythema. Among these he particularly mentioned quinine, the salicylates, chloral, mercury, belladonna and veronal. Dr. Schamberg stated that in his opinion too much diagnostic importance was attached to desquamation. The orderly progression of the desquamation, its long persistence and certain special characteristics were considered of more weight. Many scarlatinoid erythemas due to drugs and various toxic conditions cause peeling of the skin, some of them even more pronounced than that observed in scarlet fever.

The Complications of Scarlet Fever.—Dr. S. S. Woody discussed as the complications of scarlet fever otitis and mastoiditis, nephritis, arthritis, ulcerative stomatitis, tonsillitis, adenitis, broncho-pneumonia, rhinorrhea and relapses, giving many interesting details from his large service in the Municipal Hospital for contagious diseases.

The Treatment of Scarlet fever.—Dr. D. J. M. Miller read this paper. He urged against over-treatment, saying that often the issue is unfavorably affected by it. He advocated a minimum amount of milk in the diet, because of its high protein content and its tendency to provoke digestive disorders. It should be diluted with and substituted by gruels and cereals, with vegetable soups and fruits. Animal broths he considered as objectionable as meat, but in prolonged cases, with loss of weight and anaemia, he would not hesitate to give meat. The patient should remain in bed five or six weeks, even in the mildest cases. He believed that less nephritis occurred and the patients were more easily managed by this method. Daily sponging was advocated, but inunctions were postponed until desquamation occurred, because they interfered with the excretory action of the skin. He deprecated the use of carbolic acid, as poisoning has occurred from its use. Physicians who did not examine the urine daily failed in their duty. The use of drugs was entirely symptomatic; alcohol should be limited to septic cases; weak first heart-sound requires strychnia, camphor, caffein; digitalis is questionable; anaemia needs iron hypodermatically; excessive temperature and temperature continuously above 103°F. is best controlled by hydrotherapy, bearing in mind the young child's susceptibility to cold. So, too, are restlessness and nervousness, combined with nerve sedatives. The throat should be cleansed daily with antiseptic washes, the nose with cotton swabs; because of danger to the ear, douching and spraying were condemned. The ears should be examined daily; bulging of the tympanic membrane called for immediate incision.

Dr. Miller also went over treatment of the many complications in detail, and concluded with the statement that the serum treatment was still *sub judice.*

Discussion.

Dr. W. M. Welch said that the period of incubation of scarlet fever, while usually short, may be variable. He believes that in the majority of cases this period is four or five days; from three to seven days will cover most cases. The specific cause of the disease remains unknown. The susceptibility in individuals varies not infrequently. He cited the instance of a nurse who had been on duty in the scarlet fever wards for about three months and was considered immune, left the hospital, and was absent a year. On her return to duty in the scarlet fever ward she contracted the disease in a severe form. He stated that the disease is most frequent in young children, and is also most fatal among them. Many persons appear to be naturally immune. While as many as four fifths of the students who annually visit the Municipal Hospital for clincial instruction have never had scarlet fever, only one case has developed among them in the past ten years. The onset is sudden. Sore throat is the earliest symptom, and this is rarely absent. The rash makes its appearance in from six to tewnty-four hours from the beginning of illness. It prefers the trunk and extremities; frequently it is absent on the face. But whether the face be involved or not it almost always presents an appearance that is peculiar—circumoral pallor with intensely red lips. The eruption is diffuse and punctiform; frequently miliary vesicles are seen on parts where the rash is intense. Stroking the skin of the trunk and extremities will cause pale lines to appear. These will rapidly disappear by return of the capillary circulation, but in a few moments the pale lines reappear and continue for some time. This is commonly called "secondary pallor." The appearance of the tongue is undoubtedly of much importance. At first it is covered with a creamy-white coating, while its edges and tip are of bright red color and the papillae very prominent. On the third day the coating will be seen to have disappeared to a great extent, and on the fourteenth day its disappearance is usually complete, leaving the upper surface of the tongue very red and the papillae very prominent. We now have the *strawberry* tongue well marked. He regards the form of desquamation which begins at the free margins of the finger-nails and strips backward, leaving the ends of the fingers of a pink color, as most characteristic. Dr. Welch confesses that he is unable to say when a person who has recovered from scarlet fever is free from danger of spreading the disease. He has known such persons to communicate the contagion for as late a period as four months from the beginning of the illness, and long after all evidence of desquamation had disappeared. He is unable to state positively that the exfoliating particles of the epidermis are not infectious, but he firmly believes that the discharges from the nose, throat, and ears are infectious, and that they may continue so for a long time. In speaking of treatment, he favored the use of chloral hydrate where there is delirium with insomnia and restlessness. In scarlatinal nephritis he highly recommends infusion of digitalis with acetate of potash. Should the urine continue scanty recourse should be had to copious sweating by means of the hot pack.

Dr. B. H. Potts said that a very considerable percentage of his patients give a direct scarlet fever history. This is true not only of suppurative cases but also of many patients who suffer from increasing deafness without history of any ear discharge, though there may have been discharge, with membrane rupture without the patient's knowledge, the scars on the membrane giving indisputable evidence of the process. Otitis media is the most common and the most dangerous complication of scarlet fever, on account of the possibility of grave septic conditions resulting. Function is nearly always impaired and frequently destroyed. The streptococcus is the micro-organism most frequently present in discharges from the ear. Dr. Potts divides cases of scarlatinal otitis into three classes occurring at different stages of the general infection. The first is acute serous inflammation developing before the eruption, mild in form, with few symptoms and a serous discharge, which may later become infected. The second class, acute suppurative otitis, generally begins about the second week of the illness, with a rise in temperature, pain and adenitis. The third class is the neurotic type, very severe in character. Dr. Potts believes that infection occurs sometimes through the Eustachian tube and sometimes through the blood and lymphatics. Prognosis should be guarded. Patients with enlarged tonsils and adenoids are apt to suffer severely and to have continued discharge. Treatment is surgical and antiseptic. There is, unquestionably, a contagious element in the discharge of a scarlatinal otitis, and great care should be exercised in the antiseptic cleansing of the ear. The discharge should be considered a factor in quarantine. Early recognition and prompt treatment of ear complications will certainly save your patient trouble and distress and may save a life.

Dr. E. E. Graham said that scarlet fever is not very contagious during the first twenty-four hours. This is proven by the fact that children isolated promptly at the end of the first twenty-four hours very often do not contract the disease. This is probably due to the fact that contagion is not spread by the breath, and during the first twenty-four hours there is not so much membrane and discharge from the various mucous membranes. There is, of course, no desquamation, and there is probably little if any infection of urine, faeces or perspiration; or if there is such infection, it is probably less than later in the disease. Too much stress cannot be laid on the importance of isolating cases of scarlet fever as long as there is any purulent otitis, rhinitis, pharyngitis, or suppuration of the glands. All children before admission to a hospital should be carefully examined to ascertain if any such condition, should it be found, might not be a sequel to scarlet fever. The discharge of post-scarlatinal empyema is also positively capable of transmitting the disease. A scarlatiniform rash alone is not scarlet fever, for digestive disturbances in infants not uncommonly produce an erythema closely simulating scarlet fever, as also may result from anti-pyrin, quinine and belladonna. Sore throat with rash should always suggest scarlet fever. The temperature chart is important in diagnosing complications. Dr. Graham advanced several arguments against the streptococcus being the cause of scarlet fever. He also advocates nasal douching in the treatment of scarlet fever.

Dr. F. C. Knowles emphasised the resemblance between certain drug eruptions and scarlet fever, particularly in regard to quinine. Several cases of this character had been observed. Two years ago he saw a patient in Dr. Davis's service at the Pennsylvania Hospital, in whom several days elapsed before the diagnosis of quinine dermatitis could be made positively. Recently a patient under treatment for exfoliation of the palms of the hands and fingers, resembling markedly that found in scarlet fever, was found to be due to packing quinine pills in boxes and bottles. Several cases of exfoliation of the hands associated with sweating have been observed of the type mentioned by Dr. Schamberg in his paper, and previously reported by him in the Journal of the American Medical Association.

Dr. J. T. Rugh spoke of the joint manifestations of scarlet fever. They may result from the toxins elaborated or from the direct infection of the joint with the streptococcus. Surgical intrevention should be used very early in those cases due to direct infection to save the joint function if possible and often to save life, as these inflammations are extremely violent.

Dr. Miller remarked that nothing had been said in reference to the duration of quarantine in cases with the exanthema alone, as Forchheimer calls those occasional cases with throat and general symptoms but without eruption. Dr. Miller thought such cases should be isolated until the possibility of desquamation had passed two or three weeks.

Dr. Schamberg added that there was no positive evidence of the infectiousness of desquamating epithelium in scarlet fever, and there was considerable negative evidence against the view generally held. The majority of physicians of large experience no longer hold to the traditional view on this subject. Despite this, the establishing of the cessation of desquamation as the minimum boundary of the isolation period was not a bad working rule. The real lurking places of the germs are doubtless the nose, throat and ears.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

EDITED BY

KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic, Mt. Sinai Hospital, New York City.

The Treatment of Typhoid Fever in Childhood.—Le Grand Kerr, M. D., in the (*American Journal of Obstetrics* for December, 1909), asserts that children stand starvation diet badly, and that it has no place in the treatment of typhoid fever. Even under the most favorable conditions there is bound to be a loss of energy, and unless the nutrition is sufficient for all of the child's needs there will occur a considerable loss of weight. An exclusive milk diet far from meets the demands. There must be supplied to the child food which will give enough energy and allow of sufficient variety to aid in keeping him in good resistant condition. The most satisfactory method is to remove the top pint from a quart bottle of milk and dilute it with one pint or less of boiled water. In children under five years the dilution of pint and pint is best, but in older children it is better to allow the cream to remain concentrated and dilute the pint with eight ounces of water. To each ounce of the milk so treated there is added from one-half to one drachm ot sugar of milk. This latter is a most valuable addition to the diet. In the administration of food regularity must be the key-note. It is not sufficient that we prescribe a certain amount of nourishment, however often, but there should be some definite idea of the needs of the child.

For practical purposes this may be best calculated by the weight of the child.

We may proceed somewhat as follows: There should be provided such an amount of food as approximates the caloric need of a child at rest with a further addition to prevent as well as limit protein loss. For every pound of the child's weight, we should provide in each twenty-four hours approximately:

Milk (treated as suggested), 2½ ounces.
Sugar of milk, 1¼ to 2½ drachms.
Eggs (raw), ½.
Cereal gruels, 1 to 1¼ ounces.

To illustrate, a child of fifty pounds would be given (in twenty-four hours) milk, 25 ounces; sugar of milk, 12½ to 25 drachms; eggs, two to three; cereal gruels, 10 ounces.

But to add to the variety of this as well as adding an extra amount of nourishment which is easily and usually eagerly taken, the author is in the habit of using vegetable purees in the milk. The puree is made from any fresh vegetable, which is cleaned and cut fine, and covered completely with cold water. This is boiled for from four to six hours, and strained. Then the clear liquid is reboiled for five minutes, restrained, seasoned, and thickened with arrowroot. This is used as a stock, and is added to the milk in about the proportion of two ounces to eight. By varying the vegetables the appetite is appealed to. Water should be given somewhat freely and at stated intervals, although it needs to be remembered that with the milk treated as suggested there is considerable amount of water added to the diet. As soon as the temperature has remained normal for five to seven days, solid food may be added in the form of stale bread, zwieback, toast, or a well-cooked cereal. The return to a full diet can be made more rapidly than in adult cases. The return to a whole milk in the dietary should be made with considerable caution because there persists for a long time an intolerance to it.

The hydrotherapeutic treatment cannot be used as in adult cases, because many of the methods are unsuited to children.

For the pyrexia the cool pack may be necessary, but in most instances sponging with tepid water will be all that is required if the child is not dried after its use. The cold bath should be mentioned only to be condemned as unnecessary and harmful.

Sponging should be done for several minutes (fifteen to thirty) every three or four hours, unless it irritates the child. In this latter case the cool pack may be used as less exciting to the little one. But the height of the temperature is not the only guide to the necessity of this form of treatment because children differ remarkably in this particular, and the indication for a reduction of the temperature is the effect which that temperature is having upon that particular child. As a general rule, however, a temperature under 103.5° F. may be regarded as not requiring special attention in the average child.

Gastric Ulcer in Childhood.—By Martin Kaufmann (*Zentralbl. fur die gesammt. Therap.*, September, 1909); The author deals with the subject of gastric ulcer as it occurs in the later years of childhood, and describes three cases in which during the last eighteen months he has carried out a strict gastric ulcer cure. In none of the cases was the presence of gastric ulcer a matter of absolute certainty, unless the symptoms and the prompt result of the "cure" be accepted as proof. The first case was that of a boy nine years of age, who had suffered for weeks from abdominal pain localized at the pit of the stomach, and associated with the taking of food. There was no vomiting, pain on pressure, or increase of free acid, but the symptoms resisted all treatment for weeks. A typical ulcer "cure" was instituted, and a permanent recovery speedily followed. In the second case, a boy 11 years of age, severe pain in the stomach was present both before and after food, and had resisted medical treatment for months; the result of the ulcer "cure" was as striking as in the last case. The third case was that of a girl 10½ years old, in whom the symptoms had persisted for a year. Whether ulcer was or was not present in these cases, the fact remains that the ulcer "cure" was the only one which succeeded in removing the symptoms; and the author recommends that for children with obstinate stomach symptoms there should not be too long delay in embarking upon such treatment. He is also of opinion that in adults doctors in general practice are too slow to consider a case one of gastric ulcer unless hematemesis occurs or blood is present in the stools. In carrying out a cure Kaufmann would insist upon at least four weeks of absolute rest in bed, with at least two further weeks before work is resumed. For the first eight to fourteen days he gives only milk mixed with cream, or in some cases milk mixed with the sterilized creams which have a higher caloric value. Meat may sometimes be begun during the fourth week, although it may be well to wait longer, especially if the acid estimations are high. The special points of emphasis are: more frequent, longer, and more rigid gastric ulcer "cures."

Multiple Peripheral Neuritis in a Child.—by Dr. A. E. Garrod, (*British Journal Diseases of Children*). Girl, aged eight years, healthy till March, 1909, when she had an attack of abdominal pain and passed a motion containing several ounces of blood. A similar attack occurred in May. In August the pain became constant. Loss of power in the upper and lower extremities developed in September. There was no history nor evidence o diphtheria, and examinations of the urine and hair for arsenic and of the urine for lead and haematoporphyrinuria were negative. The fundi were normal.

Dr. Garrod said he had not any idea as to what was the nature of the poison at work producing the peripheral neuritis; he refrained from suggesting such shadowy things as intestinal toxins, etc., which was apt to be invoked as a refuge of the destitute. He was prepared to hear some contend that the case should be ranked as anterior poliomyelitis rather than one of peripheral neuritis, and he did not know that he could give any definite ground for excluding the former diagnosis. His diagnosis rested on having watched the case for several months and on the opinion of Dr. F. E. Batten, which he much valued.

Dr. G. A. Sutherland regarded the case as one of very special interest, but he did not think members would be able to throw much additional light on the subject, for minute examination had been made. He thought time would throw much light on the question of anterior poliomyelitis. If it were that disease there would be an affection of certain muscles. Last year he had a somewhat similar case, in which a final diagnosis was never reached. The paralysis came on rather suddenly and the child was absolutely paralyzed in extremities and trunk. The anterior abdominal muscles on the left side were paralyzed and the breathing was done by the right side of the chest. The patient continued in that condition for a long time, but there was gradual recovery. Some weakness, however, was remaining in the left leg. There was also much wasting and the child had not been able to walk properly, and now there was some spinal curvature. In some of those cases it was practically impossible to tell during the illness what the lesion was, whether it was peripheral nerve trouble or a spinal lesion.

The Management of Hemorrhage During Operations of the Tonsil.—Charles J. Imperatori of New York thinks that not sufficient attention is given to the control of hemorrhage from the tonsil in removal. Complete removal causes less hemorrhage than partial removal, and portions left behind may undergo renewed enlargement. During the operation the field should not be obscured by blood. To prevent this he gives a general anesthetic. A previous examination should be made of the coagulation period of the blood. This may be done by catching a drop on a slide and drawing a needle through it at intervals. Gauze sponges can be used to control hemorrhage, and the site be sponged as dry as possible after operation, and any bleeding points ligatured with catgut.—*Medical Record*, April 9, 1910.

Twenty-four, Forty-eight, and Seventy-two-hour Pneumonias in Children.—Le Grand Kerr of Brooklyn, N. Y., gives examples of pneumonias in children in which, with typical pneumonic symptoms, the course of the disease was so shortened as to cast doubt on the diagnosis of lobar pneumonia. He says the onset of a disease is frequently so characteristic that this becomes an important factor in the diagnosis. "This is specially so in the case of lobar pneumonia. The fact that a child in perfect health is attacked suddenly with vomiting and a chill or chilly sensations, which is accompanied by a rapid rise of temperature to 103° F. or over, is suggestive of pneumonia." He avers the onset is almost always accompanied by vomiting and this vomiting has been said to take the place of a rigor, but of this he is doubtful for in practically every instance in which vomiting has occurred it has also been accompanied by some condition which approximated a chill, as coldness of the extremities and cyanosis which is most marked about the lips. Another common feature of the onset he claims is drowsiness which does not last for more than twenty-four hours and then disappears entirely or is replaced by a mild delirium. He is inclined to look upon the cough during the first forty-eight hours as a rather insignificant symptom and we do not attach much importance to its presence or absence during this period. Expectoration is only seen frequently in children when they have reached the age of ten or over; in those younger its occurrence is rare and under the age of four years is practically never encountered. He also believes that when we have the symptoms of sudden onset, the high temperature, early prostration, increased respiration with the pulse-respiration ratio changed, and the physical signs definite, with initial vomiting and chill, we are justified in making the diagnosis of lobar pneumonia, and of sustaining it even with a duration that is less than normal.—*Medical Record*, April 23, 1910.

Congenital Recesses of the Lower Lip (*"Liverpool Med.-Chir. Journ.," vol.* xxix, 1909, *p.* 352),—Dunn records three cases of this interesting condition, of which only thirty-eight cases have been published. In nearly all it has been associated with hare-lip with or without cleft palate, and in many several members of the same family have been similarly affected. Case 1: In addition to double hare-lip and cleft palate the child had two small openings on the thickened and everted lower lip symmetrically placed and close to the middle line. From the openings sinuses ran downwards on the outer aspect of the lip. Case 2 was similar to the first, but at the orifices of the sinuses nipple-like processes were present which were capable of retraction and prof trusion like feelers. Case 3 also had hare-lip and cleft palate, but instead o- two symmetrical sinuses showed a single mesially placed cavity in the lower lip three quarters of an inch long and a quarter of an inch deep. The left testis was undescended, and the right lay in front of the pubes and partly on the dorsum of the penis. Death took place at the age two weeks. In the other cases the lining membrane of the sinuses was dissected out, and proved to be similar to that of the lip and to certain numerous mucous glands. In none of Dunn's cases was there a family history of congenital recesses of the lip or any other deformity. For the literature reference is made to Clogg's paper in the *British Journal of Children's Diseases*, 1907, p. 52.

Periodic Vomiting in Children.—Comby (*Journ. des praticiens*, November 17th, 1909) describes an affection observed during the second period of child life, between 18 months and 6 years of age, characterized by attacks of obstinate vomiting lasting from one day to several, and repeated with a certain degree of periodicity, although sometimes after intervals of variable length. Comby has collected statistics of 100 cases, and has found that the first months of childhood are free from attacks, and that the malady selects children with an arthritic family history. It has been observed in different members of the same family—a brother aged 9 and a sister aged 8; twin sisters of 3; two brothers of 5 and 3; three brothers; brother and sister; father and son have been among the cases cited. The exciting causes of the attack comprise cold, fatigue, emotion, and gastronomic excesses, and the children have always had a history of cerebral irritation, spasm of the glottis, or laryngismus stridulus. Digestive troubles have also had their place in the previous history, as well as adenoid growths, and finally appendicitis, the last named having been found in 40 per cent. of the cases. The vomiting has been attributed to general acidity, and in particular to the formation of diacetic acid or of acetone; but Comby regards these evidences of incomplete oxidation of fatty matters not as the agents, but as the results and the evidences of digestive toxemia, showing itself by paroxysmal vomiting; whilst Hutinel regards the vomiting as being consequent on auto-intoxication of an arthritic nature. The information obtained from the few autopsies is not precise—slight lesions of the gastro-intestinal mucous membrane, slight cellular degeneration of the liver, very rarely a patch of hemorrhage in the suprarenal capsules. The attacks may come on at a time when the child seems in the most perfect health, and may occur quite suddenly at any hour of the day or night, although sometimes there has been warning in the shape of a little loss of appetite, foulness of breath or nausea. If the stomach is full, its contents are first rejected, and afterwards the vomited matters are watery, mucous, and finally bilious. Blood was noticed only three times. In 27 cases, Comby observed an odour of chloroform in the breath, suggesting acetonaemia or acetonuria. The attacks last from half a day to three or four days, the longer periods being interrupted by intervals of cessation of symptoms; but however short the attack may be, it is sufficient to cause emaciation, with sinking of the eyes and sharpening of the nose, as in cholera or meningitis. When the fit is over, however, the child is quickly himself again. Constipation was present in more than half the cases, and abdominal pain in 25; this latter symptom is important and points to the possibility of appendicitis. The intervals between the attacks are very variable in length, from a week to six or eight months, and the prognosis is favorable, although the possibility of seriousness must not be lost sight of. The diagnosis has to distinguish it from simple indigestion, accidental poisoning, migraine, intestinal obstruction, appendicitis, and meningitis. If there is any warning beforehand, the treatment may be directed towards averting the attack by the administration of alkalis, such as large doses of bicarbonate of soda and Vichy water, so as to nertualize the general acidity. The stomach may also be washed out, and enemata of chloral and bromide may be given, or even hypodermic injections of morphine. Between the attacks the diet should be vegetarian, the skin should be kept active by baths, overwork at school must be avoided, and the little patient should live in the fresh air as much as possible.

Sources of Tubercle Bacilli in Cow's Milk.—Professor Delepine, Medical Officer of the Local Government Board in the *London Lancet*, in an instructive discussion on the cow's udder gives some useful diagrams of these organs showing tuberculous affections of certain quarters. The several sources of the tubercle bacilli found in cow's milk are fully dealt with and the parts played in such production by muco-purulent discharges from the respiratory passages, by faeces, by urine, and by utero-vaginal discharges are passed in review. Professor Delepine concludes that by far the most important source of the tubercle bacilli is the cow's udder itself, and he has made some instructive investigations with the object of ascertaining how much milk might be infected by a tuberculous udder—a matter obviously of great administrative importance. It was found that one part of the tuberculous secretion could infect 100,000 parts of sound milk, and, although the dilution was carried no further, it seems not improbable that this milk diluted 1,000,000 times might still have been capable of infecting guinea-pigs. As, therefore, many cows with early tuberculous disease of the udder yield very large quantities of milk, the tuberculous milk may, when the milk of all the herd is mixed together, infect a very large quantity. Under these circumstances it is consoling to find that in the majority of cases when laboratory experiments showed that the mixed milk from a farm was capable of inducing tuberculosis, the veterinary surgeon was able to discover a cow amongst the herd with a tuberculous udder. At the same time Professor Delepine's investigations show the very great difficulty which obtains in detecting early tuberculous lesions of the udder by inspection and palpation alone, and the need for simultaneous bacteriological examination of the milk from the suspected udder is clearly demonstrated. In this part of the investigation some very useful data were secured by Professor Delepine by purchasing a cow suspected of having a tuberculous udder, and in the stable attached to his own house observing the changes which took place in the udder and the yield of tubercle bacilli in the milk.

BOOK REVIEW

Congenital Dislocation of the Hip, by J. Jackson Clark, M. D., Lond. G. R. C. S. Senior Surgeon to the Hampstead and North-West London Hospital and Surgeon to the Royal Orthopedic Hospital. Demy 8 Vol. 200 pages, illustrations 55, $1.50. London Bailliere, Tindall and Cox, 8 Henrietta Street Covent Garden. Paul B. Hoeber, New York.

This little volume succinctly but clearly presents the author's personal experience with the manipulative method of the treatment of Congenital Dislocation of the hip joint. This method is truly surgical from the etymological and scientific sense of the word. It is also truly orthopedic according to Andry, the founder of this branch of surgical Pediatry, who says the manipulative method is "The Art of Preventing and correcting deformities in children." The author dwells at length on the difficulties and dangers of this method when not skillfully carried out or performed on children of suitable age with a view of enabling others to avoid a repitition of his unpleasant experiences. He also points out that such dangers arise almost entirely from treatment being too long delayed.

This manipulative method of treatment of congenital dislocation of the hip joint was given great prominence in this country a few years ago when Professor Lorenz demonstrated the method in the most prominent hospitals of the larger medical centers and since that time "bloodless" surgery has been given a great deal of attention by orthopedic practitioners. The author of this work has worked with Prof. Lorenz and this book gives a clear exposition of the great master's technic in bloodless surgery.

The illustrations of this volume clearly depict the pathological condition from which so many children suffer and which this "bloodless" surgery will completely relieve. This is the most valuable work on the subject extant, and should be in the hands of every orthopedic surgeon, as well as in the hands of every pediatrician.

The Diseases of Infancy and Childhood. Designed for the Use of Students and Practitioners of Medicine, by Henry Koplik, M. D. Attending Physician to the Mount Sinai Hospital; Consulting Physician to the Hospital for Deformities; formerly Attending Physician to the Good Samaritan Dispensary, the St. John's Guild Hospitals, New York; Ex-president of the American Pediatric Society; Member of the Association of American Physicians, and of the New York Academy of Medicine. Third Edition revised and enlarged. Octavo 900 pages illustrated with 204 Engravings and 39 plates in color and Monochrome. $5.00 net; leather $6.00. Lea & Febiger New York and Philadelphia.

This admirable work contains a thorough and complete resume of the whole subject of diseases of children and is the most complete exposition of the world's best and latest knowledge in Pediatrics. The author's aim in presenting this work was to furnish both students and practitioners with a trustworthy presentation of the science of Pediatry. The author devotes sufficient space to etiolgy and pathology before leading up to a full consideration of the more directly practical subjects of diagnosis including differentiation and treatment. Dr. Koplik's long services and wide clinical experience as attending and consulting physician in hospitals and private practice is ovbious in his thorough explicit and definite therapy.

In the preparation of this edition the work has been thoroughly revised with the addition of much new matter. The rapid advances in our knowedge of special pathology, diagnosis and treatment of the more important diseases of infancy and childhood made a new revision imperative. Since the appearance of the last edition new ideas and discoveries have been such as to shed light on many heretofore obscure problems in Pediatrics. The author, in the light of these advances, as well as from his accumulating experience has entirely re-written many chapters of this work, particularly so in the section devoted to the technic of treatment and diagnosis of infectious diseases. The rapid advances and improvements in infant feeding has enlightened our understanding on certain disturbances of nutrition, and Dr. Koplik has taken advantage to incorporate in this revision the latest information on this most important subject in a manner that is simple, easily grasped and readily put into practice. Other subjects in which many changes have been made are cerebral palsies, encephalitis, poliomyelitis, tetany and amaurotic idiocy; which now contain the latest ideas in pathology diagnosis and treatment. The chapters on cystitis and pyelitis have been changed and brought up to date and chapters have been added on idiocy, dwarfism and neurotic conditions, which will be found of great value by the practitioner and pediatrician. The chapter on the treatment of epedimic, cerebro spinal meningitis is a thorough resume of the latest teaching on this subject, with the exception of the late teaching of Flexner, who has perfected a serum for injection through the anterior fontanelle. The author, however, states that his experience with this method is too limited to make any positive statements.

The illustrations in this edition which are mostly original, executed from the author's drawings of his own cases add much to the text. The author presents a detailed, yet succinct reflection of the present status of Pediatric knowledge which is not surpassed by any other treatise on the subject and offers the well informed man a repertoire of the science and art of Pediatry. The publishers realize the great value of the volume and give to it all the art in book-making for which their house is justly famous.

The Roentgen Ray in Pediatrics. The Diagnosis of Diseases in Early Life by the Roentgen Method, by Thomas Morgan Rotch, M. D., Professor of Pediatrica; Harvard University. Pp. 225, with 303 illustrations, net $6.00. Philadelphia and London; J. B. Lippincott Company, 1910.

The purpose of the volume is to deal as little as possible with apparatus and technic and to devote the entire space to the direct clinical teaching of the subject under consideration. This, the author, does from the standpoint of the clinician, and he most admirably handles the subject of X-ray diagnosis in connection with pathological conditions resulting from developmental abnormalities manifest during infancy and childhood. The work is devoted entirely to the diagnosis of diseased conditions, and makes no attempt to consider the subject of treatment. The work contains 303 illustrations reproduced in half tone from X-ray plates and opposite the plates are placed descriptions which describe in detail the minutia of the illustration as would be done, if an expert Roentgenologist were standing beside him describing the plate by means of an illuminator. The different parts of the plate, whether normal or abnormal, are designated by leaders and by letters just as the Roentgenologist would deisgnate them with his pointer.

In the general arrangement of the book, the various conditions considered are grouped in several divisions, according to age or region of the body, and in each division several pages of text are devoted to a summary of characteristic pathological and clinical features of each condition, followed by an enumeration of such of these features as are demonstrable by the X-ray examination, the characteristic radiographic features to be determined, and their proper interpretation and application as diagnostic data. Following the text in each division are several pages of radiographic reproductions, to which suitable references are made in the text, and which clearly and fully illustrate all of the important radiographic features discussed. The subject is discussed in a manner that is likely to appeal especially to the medical student and the recent graduate, and the inexperienced beginner in X-ray work will also derive much benefit and assistance from this work.

In addition to the discussion of X-ray diagnosis, Professor Rotch presents a subject that is evidently of particular interest to the pediatrician, He begins his illustrations by presenting a set of normal Roentgenographs covering the different stages of development from a late period of intra-uterine life through childhood. He next exhibits X-ray plates of certain parts of the body, especially the wrist and hand, comparing the radiographs of diseased conditions with those of individuals of the same age with a normal standard of anatomical and physiological development. By this portrayal of normal living anatomy and the grosser forms of abnormal conditions, the student is prepared to understand the finer pathologic conditions in the case under examination. The work is then further divided into groups, representing living pathologic conditions. In one division the head and spine is described. In another he gives in detail what can be seen in Roentgenographs of the thorax, bronchi, lungs, plurus, pericardium, and the heart and aneurism. The next division considered is the abdomen, which is the most difficult part of the body of an infant to illustrate by means of the Roentgen method. However, the author very successfully illustrates how foreign bodies may be detected in different parts of the thorax and abdomen by means of the X-ray.

After a most careful examination we pronounce the work, without exception, the most excellent collection of X-ray illustrations illustrating diseased conditions of infancy and childhood that we have ever seen. Prof. Rotch has placed the profession under lasting obligations, and is to be congratulated on this most worthy addition to Pediatric literature. The work is a piece of book making which is truly admirable, with plates and text so really well chosen and so clear that diagnosis is made easy.

PEDIATRICS

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EDITORIAL

PATRIOTIC TETANUS—CAUSE AND PREVENTION.

The coming stupenduous holocaust, caused by the sky-rocket, the giant fire cracker and the toy pistol, that leaves an annual trail of disaster following the glorious 4th of July celebrations, is a subject for our serious consideration.

True patriotism should be encouraged, but Independence Day should not be made a day of licensed lawlessness, a day of rough rowdyism—a day of peril of life, limb and property, a day of noise, nuisance and destruction—features too anarchistic to do credit to our National intelligence or to reflect a genuine spirit of true patriotism.

The casualties resulting from the inglorious and irrational 4th of July, as it has been celebrated in the past are astounding. The last seven such celebrations report a total of 34,000 persons killed, blinded and mained. The mortality from tetanus from celebrating the last 4th of July celebration was 120 deaths. Statistics prove that more than one third, of the annual deaths from tetanus occur during the month of July. In the year 1903 the celebration of the glorious 4th was responsible for 415 reported cases of "Patriotic Tetanus." Dr. Roswell Park, of Buffalo, New York, estimates that during the last 20 years more than 8,000 deaths have occurred from tetanus.

A study of these appalling fatalities raises the question, as to what extent is the profession responsible. No physician can hold himself blameless who carelessly neglects the well defined treatment of blank cartridge injuries, no matter how slight or how trivial they may appear. Is the family physician called to such a 4th of July accident free from censure who delays prophylaxis until symptoms of tetanus appear? May we suggest, here, the advisability of calling our readers attention to the value of immunizing doses of antitoxin for preventing tetanus following infection caused by blank cartridges, toy pistols, gun shot wounds, or from explosions of fire crackers, especially following casulties resulting from the inglorious 4th of July, as it is celebrated in this country.

If there is any disease whose treatment is distinctly prophylactic it is tetanus or lock-jaw; when symptoms appear, treatment is of but slight avail, therefore, we feel it our duty to impress upon the profession the necessity for radical and rational preventive treatment, when called to an accident resulting from celebrating the glorious 4th. The first thing in preventive treatment would be to prohibit the sale of all manner of fire works, but the profession cannot control this great commercial industry; however, they can use the antitoxin serum to prevent tetanus when called to treat an accident. This is their duty, and a physician who fails to promptly administer the antitetanic serum is derelict in his duty, to his patient, to the family and to the profession.

The following table is taken from an article by Scherck in the A. M. A. It constitutes quite a forcible plea for the prophylactic employment of antitetanic serum as a preventive of tetanus. Cases of 4th of July "Patriotic Tetanus" injuries treated in the city dispensaries at St. Louis in the year 1903, 56 cases treated without antitetanic serum, 16 deaths. In 1904, 37 cases treated with antitetanic serum, no deaths. In 1905, 84 cases treated with antitetanic serum, no deaths. In 1906, 170 cases treated with antitetanic serum, no deaths.

By way of comparison we give the casualties of seven famous battles of the American Revolution. Here they are:

Battles

	Killed and Wounded
Lexington	83
Bunker Hill	449
Fourt Moultrie	37
White Plains	100
Fort Washington	149
Monmouth	229
Cowpens	72
	1,119

Celebrations

	Killed and Wounded
July 4th, 1903	4,449
July 4th, 1904	4,169
July 4th, 1905	5,176
July 4th, 1906	5,446
July 4th, 1907	4,413
July 4th, 1908	5,623
July 4th, 1909	5,307
	34,603

More appalling even than these figures is the fact that 1531 men women and boys and girls were killed in the last seven Fourth of July celebrations—actually four hunderd and twelve more deaths in seven happy holidays than there were soldiers dead and wounded in seven of the Nation's battles for freedom.

PERICARDITIS IN CHILDHOOD.

When children suffer with repeated attacks of rheumatism, complicated by pericarditis, a chronic pericarditis frequently follows. Associated with this condition there is frequently observed chronic myocarditis, hypertrophy, diliation, and valvular lesions, so that no portion of the heart muscle or its lining membrane is normal. The disease is rarely encountered before the third year of life, although later on it is frequently observed as a complication in uric acid dealtheses. Next in frequency it is secondary to pleurisy or to pleuro-pneumonia, and as a sequellae following particularly scarlet fever, pyemia, tuberculosis, and local conditions as traumatism, abscess, necrosis, etc.

The difficulties of diagnosis are three fold in infancy; there is the rapid action of the heart, the remarkable compensatory powers, and the non destructive character of the symptoms. The acute dry form of pericarditis is so rare under three years of age that a diagnosis must be made with a great deal of caution. After the third year, the diagnosis of pericarditis in the acute form is made by practically the same symptoms as in the adult, but the early recognition of the disease comes by a clear recollection of the etiological factors, and repeated examination of the heart.

According to Fischer there is a contraction seen behind in the infra-scapular region; sometimes on the left, sometimes on the right side, in the region of the eleventh or twelfth rib. Anteriorly we have the characteristic signs. There is a systolic retraction of the chest at or near the apex of the heart, sometimes at the tip of the sternum. This is due to the external pericardial adhesions, and is often better made out by palpation than by inspection. After the systole there is a rapid rebound known as the diastolic shock. A collapse of the cervical veins during the diastole of the heart, known as Friedreich's sign, is also seen. Sometimes we see an inspiratory swelling (Kussmaul). In addition the pulsus paradoxus is significant of the presence of pericardial adhesions, or rather of the dilatation that succeeds the adhesions. The pulse is small and feeble during inspiration, assuming greater strength during the period of expiration.

Percussion shows an increase in the cardiac dullness in all directions. The position of the apex and the percussion outline of the heart do not change with the posture of the patient, and the cardiac dullness is but little affected by full inspiration. A systolic murmur is often present. The diagnosis of adherent pericardium always presents difficulties, but it can be made with tolerable certainty in a considerable portion of the cases. On account of the enlargement of the heart and the frequency of murmurs, it is unusually mistaken for valvular disease. The lesion is a permanent one and tends to increase. If a child suffers with valvulitis and the symptoms do not yield to diagnosis then adhesive pericarditis should be suspected.

Treatment—There is no known method of treatment which will modify or improve this condition, except a supporting diet with absolute rest in bed and general restorative treatment. It is very important to watch the emunctories and stimulate them if their action is sluggish.

ILL-NOURISHED CHILDREN: ANOTHER PHASE OF THE QUESTION.

The subject of the nourishment of the children of the poor has attracted considerable attention of late, as the public awake to the realization that sickly children cannot make strong men and women, and that such men and women are a matter of vital importance to the nation. One phase of the question has been handled more directly in Boston than elsewhere, and some of the results noted there may be commended to the attention of our larger cities, especially New York.

In a recent discussion in the latter city regarding the children who go breakfastless to school, one whose experience warranted knowledge of the matter said that after a mother, going early to work, would give a child a few pennies and tell him to get his own breakfast. The child was apt to be attracted to the cheap candy counters which abound in the poorer districts, and there spend his pennies for sweets which at the best consist of glucose, vegetable dyes and paraffine, and at the worst of an insoluble form of paraffine and deleterious coloring matter. That this candy-eating habit is largely prevalent among the children of the poor, no one can doubt who has even a casual acquaintance with the regions where they live, and such an acquaintance provides a lively recollection of the counters spread with wares exposed to the dust and filth and flies from the street.

It is true that the Board of Health inspects the stock of these small dealers, and has power of confiscation as regards the wares containing matter actually poisonous. But this does not reach the vast majority who deal in stuff which is merely an inadequate substitute for the food which the little bodies need. Naturally, after dumping a quantity of these cheap sweets into his stomach the child experiences loss of appetite, if not a more serious disturbance of digestion, and the continued use of such substances results in disorders of the stomach, anorexia, and loss of power to resist disease.

The objection has been raised that children in such a position ought not to spend money for candy anyhow, and should be discouraged from doing so and taught to save pennies, but "it is a condition that confronts us, not a theory," and so long as the cheap candy counter besets the child's steps at every turn it is folly to talk of stopping all expenditures in that direction. The best that can be done is to provide an opportunity for getting his money's worth in pure, wholesome sweets, and possibly at the same time, if the candy counter is under the charge of the settlement workers, gain his confidence to persuade his pennies ultimately into wiser channels.

UNWHOLESOME FOOD AND LACK OF VENTILATION MAKE TOO MANY SHORT COFFINS.

There are too many short coffins being sold in this country· There is a reason for it. What is it? It is an alarming fact that more than 18% of all children born die during the first year of life and still more deplorable is the fact that almost 50% of all children born die before reching the sixth milestone in life's journey.

What a sacrifice of children. We ought to rear children instead of burying them. We have pointed out in the foregoing editorial the want of proper nourishment in infancy and childhood as a factor in infantile mortality and will briefly make a plea for better ventilation systems in homes and public schools. Children need more fresh air and more recreation. They ought to have *carte blanc* in all public parks. Let them play on the grass, in the sand and get closer acquainted with nature and nature's way. Give them wholesome food and better ventilated living and sleeping apartments and there will not be need for so many short coffins.

BLEEDING FROM THE RECTUM IN CHILDREN.

If a mother says that she notices a little blood in the child's motion, and that the bowel comes down each time it evacuates, it may be a case of prolapsus, but it may also be a case of polypus of the rectum. This latter is not at all uncommon in children, and with the finger it can at once be ascertained whether there is a body hanging down by a narrow pedicle some inch or so within the rectum; if so, it is a polypus, and one should immediately, with the nail, tear the pedicle and take the polypus away. Though the polypus has been the cause of hemorrhage in the rectum, sometimes for months together, it is very remarkable that one can tear through the pedicle and have no hemorrhage at all.

PEDIATRICS

ORIGINAL ARTICLES

A STUDY OF FIVE HUNDRED AND FIFTY CASES OF TYPHOID FEVER IN CHILDREN.*

BY

SAMUEL S. ADAMS, A. M., M. D.

Professor of the Theory and Practice of Medicine and of Diseases of Children in the Georgetown University, Washington, D. C.

In this study of 550 cases of typhoid fever treated in the Children's Hospital, District of Columbia, many obstacles, some insurmountable, were encountered. The period over which the investigation extends has been divided into three and a half decades, which seem to conform to the changes of ideas respecting this particular disease, embracing the years 1872 to 1908, inclusive. During the first decade all cases of typhomalarial fever were excluded, because this was then thought to be a distinct disease possessing only a few symptoms similar to those found in enteric fever. During the second decade these were included, because, by common consent, all typhomalarial cases were then recognized as enteric. In the third decade, cases of mixed infection which, in their clinical and pathological phenomena were identical with the typhomalarial diseases of the previous decades, have been incorporated. There might have been justification in swelling the number by including the many cases recorded in the first fifteen years under the headings *infantile remittent*, *remittent continued*, and *irregular* fevers, because I was then serving as an assistant physician in the hospital, and in the light of our present knowledge, I now believe that such cases were genuine enteric fever. In spite of the fact that continuous connection with the hospital since 1876 has given me ample opportunities for careful study of those cases, I do not feel justified in changing the diagnosis made by my predecessors.

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* American Journal of the Medical Sciences, April, 1910.

In the earlier years of practice I was among the few who did not believe in the immunity of infants and young children to enteric fever. When some advanced the opinion (from which they have fortunately receded) that infants rarely, if ever, had enteric fever, and supported it by their failure to find the intestinal lesions of the disease in a large number of necropsies, I strenuously contended that infants and young children had a disease, which clinically was the analogue of enteric fever in the adult, and shortly thereafter presented to our local society the intestine from an infant showing lesions identical with those found in adults who had died of enteric fever. During the past ten years, I have seen an epidemic in one of our institutions, which spent its force upon infants under one year of age; and during the last five years have seen, in private practice, at least a dozen typical cases, several of which were used to illustrate a lecture on typhoid fever in infants, delivered at the Harvard Medical School in 1907. The clinical phenomena, including direct infection, were those of enteric fever, and I presented a specimen from one of the cases which showed ulceration and perforation of the ileum. Of late all doubts on this point have been dispelled by pediatrists generally. The acceptance of the theory of immunity unquestionably obscured the diagnosis in a number of cases, which might otherwise have added to the interest of this paper. Enteric fever in the child differs in degree only from that in the adult. While the clinical phenomena differ somewhat, the structural changes are identical, regardless of age.

There has been an annual increase in the number of cases treated in the hospital relative to the whole number of patients admitted. This has been about uniform, except in two instances when it was much greater owing to the prevalence of enteric fever, in epidemic form, in the city.

Season. Of the 550 cases, 420 (76.54 per cent.) were admitted during July, August, September and October.

Table Showing Cases Admitted by Months.

	Cases.		Cases.
January	18	July	78
February	11	August	153
March	6	September	119
April	11	October	70
May	6	November	38
June	21	December	18

Sex. Two hundred and ninety-six boys and 254 girls were treated, this being about the proportion in adults admitted to general hospitals.

Age. At the orgaization of the hospital the maximum age of children admitted was fifteen years and the minimum two years. The maximum was gradually lowered until in 1888 it was fixed at twelve years, which accounts for the small number between twelve and fifteen years. There is a decided increase in the number admitted after the fourth year, which may be due to increased susceptibility at the beginning of school-life.

Table Showing Ages.

	Cases.		Cases.
One year	1	Nine years	61
Two years	22	Ten years	72
Three years	29	Eleven years	77
Four years	27	Twelve years	33
Five years	50	Thirteen years	3
Six years	50	Fourteen years	3
Seven years	65	Fifteen years	5
Eight years	40	Not given	2

Mode of Conveyance. It is a singular coincidence that the first case of enteric fever treated was attributed to the eating of oysters. This was in 1872, and yet it was quite twenty-five years thereafter that the oyster was recognized as a carrier of typhoid bacilli. Four cases were attributed to polluted milk, 25 to water, and 43 to contagion. In 478 cases no record was made as to the mode of conveyance. In the 43 cases attributed to contagion there was in every case evidence of direct exposure, in many instances several cases having occurred in the same family. The proof is positive in several cases in which water is mentioned as the medium. These cases came from a locality where enteric fever was epidemic at the time of their admission. The children, as well as many, if not all, of those affected, had drunk the water from a neighboring well, which upon examination, was found to contain the colon and other bacilli, together with fecal matter.

Morbid Anatomy. In 43 cases the necropsy revealed the characteristic lesions and in addition structural changes in the other organs. In 22 necropsies were not permitted.

Perforation was found in 17 cases, all being of the ileum. In one case three perforations were found, in two cases two, and in the remainder but one.

Hemorrhage. Twenty-eight deaths resulted from hemorrhage, but in no instance could the bleeding vessel be found.

Spleen. The spleen was almost invariably enlarged in the fatal cases.

Liver. No pathological condition was found in the liver. Abscess of the gall-bladder was found in one of the recent cases.

Kidney. Acute nephritis was present in eight cases, the condition having been recognized before death.

The respiratory organs were affected in seven cases, the *circulatory* in three, the *brain* in three, the *peritoneum* in two, and the *bladder* in one.

Mode of Onset. The disease was recorded as beginning insiduously in 361 cases, with diarrhea in 17, malaise in 14, chills in 66, suddenly in 81, delirium in seven, cough in five, vomiting in eight, headache in six, synovitis, stupor, nausea, and tonsillitis in two each, and with coryza, adenitis, arthritis, erythema, sweats, and insomnia in one each; and the onset is not mentioned in 24 cases.

Symptoms. *Temperature.* The course of the fever in children is usually of the remittent type, ranging from 103° F. to 105° F., and terminates by lysis. In this series the fever in 279 was remittent, in 24 intermittent, in three irregular, and in two atypical. The fever terminated by lysis in 241 and by crisis in 19. Posttyphodial rise was noted in four cases and was due to some error in management. There were 11 septic cases that were most pronounced; four of these died. Recrudescence was noted in a very small proportion of cases. Chills were recorded in 73 cases, 13 being at the outset.

Rose-spots are not as frequent in children as in adults. They were present in 133 cases only, but as about 20 per cent. of the cases were negroes, the percentage is not accurate. Sudamina and malaria are more common in the negro child.

Sweats. More or less sweating at the height of the fever is not uncommon, and in this series it was so profuse in 10 cases as to classify them under the sudoral variety.

Bed sores so seldom occur in children that it was not regarded as important to consider them. Furunculosis occurred seven times.

Circulatory System. The changes presented by the blood differ slightly from those found in the adult. There was one case of pericarditis and endocarditis and one of endocarditis. One case of phlebitis of the femoral vein was noted.

Digestive System. Five cases of ulceration of the mouth, one being gangrenous, were recorded. One case of esophagismus of exceeding interest was found. The boy was seven years of age and had a typical, moderately severe, attack of enteric fever. At the height of the disease, in attempting to take drink or nourishment, a tonic spasm of the oesophagus would occur. This necessitated rectal feeding. After a long convalescence the patient recovered. Adenitis and parotitis occurred in 21 cases, most of which suppurated. Pharyngeal symptoms were recorded in eight cases. Diarrhea was of infrequent occurrence after the first stage, and when present was usually controlled by change of food. Hemorrhage occurred in 54 cases (9.8 per cent.); 27 (50 per cent.) of which died. In one case there were three profuse hemorrhages and the child recovered, while in the 27 fatal cases, but one hemorrhage was recorded. Meteorism and tympanites were noted in 14 cases. In six the distension was unusually great and caused intense suffering. Abdominal tenderness and gurgling were not as frequently observed as in the ordinary diarrhea of children. Indeed, I regard the gurgling and tenderness in the right iliac fossa as of little practical clinical value. Of the 550 cases there were 17 (3 per cent.) with perforation all of which were fatal. The diagnosis of perforation was made in every case within a few hours after its occurrence. In several cases an operation was proposed, but the parents would not permit it. In other cases peritonitis developed so rapidly that an operation was not deemed advisable. Three children were operated on when *in extremis*, and died a few hours thereafter. Enlargement of the spleen was recorded in 149 cases, but undoubtedly greater care in case-recording in the earlier decades would have increased the number. Epistaxis was found in 225 cases (40.9 per cent.) in many of which it was troublesome and in one profuse and fatal.

Pulmonary System. *Bronchitis* was present in 31 cases in the earlier stages. *Pneumonia* was noted in 15 cases, one of which proved fatal.

Nervous System. Delirium. Children usually bear high temperatures much better than adults, but our statistics show a large percentage (56.18 per cent.) of nervous per urbations attributable to the pyrexia. The amount of fever formed no index of mental disturbances.

Table Showing Type of the Delirium.

	Cases.
Mild	51
Low, muttering	155
Wild	59
Maniacal	8
Hysterical	1
Stupor	12
Coma	1

The distinction drawn between *wild* and *maniacal* delirium is arbitrary. Those classed as wild were thoroughly unaccountable and required restraint; while the maniacal had hallucinations, delusions, and violent tendencies. *Convulsions*: In 16 cases convulsions appeared during the fastigium and not at the onset, as is the case in other infectious diseases in children. All of these cases were fatal. *Neuritis*: Local neuritis during convalescence was observed in five cases, all of which recovered. *Hemiplegia* with a fatal termination occurred once. *Post-typhoidal* insanity was observed during convalescence in nine cases, which had run a mild course without delirium. They were all due to faulty nutrition and promptly recovered with improvement in general health. I have reported four of these cases.*

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*Trans. Amer. Pediatric Society, viii, 177.

Ear. Otitis media supervened in 15 cases (2.7 per cent). Suppuration was profuse but the disease only invaded the mastoid cells in one case. Deafness, sometimes profound, was frequently observed during the height of the disease, but always disappeared with the subsidence of the fever.

Renal System. Retention of urine is not often met with in children, but it was mentioned in two of these cases. The diazo reaction was applied in 182 cases, with 73 (40.1 per cent.) positive. (The test is made when the child is admitted, and daily thereafter, but the positive reaction is often delayed as late as the third week.) This test was abondoned several years ago. Albuminuria during the febrile stage occurred in 40 cases (7.2 per cent.), but usually disappeared during convalescence. Acute nephritis was noted in 15 cases (2.7 per cent.), five being fatal.

Postenteric pyemia infrequently manifests itself by abscesses. At one time there were three cases of perirectal abscess in the hospital. No case of multiple abscesses was recorded, but a boil on the head, buttocks, thigh, or back was not uncommon.

Association With Other Diseases. In an institution in which tuberculous diseases prevail so extensively, it is somewhat surprising not to find acute miliary tuberculosis associated with, or directly following, an attack of enteric fever much earlier than 1909. Since then pulmonary tuberculosis has fatally attacked five convalescents, which are included in this series. Scarlatina, measles, malaria, and pseudo-membranous pharyngitis and laryngitis also complicated the cases. Cancrum oris occurred in four cases, all being fatal.

Varieties of Fever. Typhoid fever in children presents such various modifications in its complex symptomatology that its classification as to degree depends entirely upon the observer. The course might be considered mild, and yet hemorrhage or perforation would cause an unexpected fatal termination; on the other hand, a case may be grave from the initial stage, and when least expected a rapid return to health may take place. It has been our custom to classify as follows:

	Cases.
Mild	264
Moderately severe	132
Severe	142
Irregular	2
Sudoral[*]	10

Relapses. There were 48 relapses (8.7 per cent.), four cases having two each, with one death. In a case of septic enteric fever death occurred during the relapse. My experience has been that a relapse is of milder type and shorter duration than in the adult. The relapses here noted are true ones, but several spurious relapses have occurred which were of slight significance.

Diagnosis. There have been but few mistakes in diagnosis, the greatest difficulty being to differentiate enteric from estivo-autumnal malarial fever, when the blood examination was negative. However, observation and repeated blood examinations finally settled the question. The Widal test was applied in 283 cases and gave positive results in 130 (49 per cent.). This percentage is a trifle lower than the results of other observers and may have been due to imperfect methods, which were unavoidable, before the establishment of a laboratory in the hospital. During the last five years a positive reaction has been obtained at some time during the course of most cases, but in most cases during convalescence, and in a few tests have invariably been negative. No blood-cultures have been made.

Mortality. There were 65 deaths, a rate of 11.8 per cent. Taking the periods separately, we see the greatest reduction in the last decade and a half, which is unquestionably due to the methods of treatment employed. It must be stated that a number, especially colored children, died within forty-eight hours after admission, and, although they are included in the death-list, yet they might, with propriety, be excluded, which would reduce the mortality considerably.

	Cases.	Deaths.	Mortality. Per cent.
1872-1882	26	8	30.76
1882-1891[†]	59	12	20.33
1892-1903[‡]	252	28	11.1
1903-1908	273	17	7.9

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[*] The term sudoral is used to define a condition in which there is profuse sweating during the fastigium.

[†] It will be seen by the table that no cases are given in 1885. This omission as well as that of 1897, was owing to the loss of records. In the annual report, 1885, three cases are reported, all of which recovered, which will reduce the mortality of the second decade to 19.35 per cent.

[‡] In 1897 11 cases were treated and one died, which will reduce the mortality in the third decade to 9.27 per cent.

Analysis of the fatal cases. There were 32 boys and 33 girls, whose ages ranged as follows: Two years, two; three years, three; four years, four; five years, eight; six years, eight; seven years, eight; eight years, two; nine years, six; ten years, twelve; eleven years, eleven; twelve years, five; and fourteen years, two. One was infected by oysters, two by milk, five by contagion, and four by water. The necropsy was made in forty and revealed the characteristic local and parenchymatous lesions. In four, subjects who had died of pulmonary tuberculosis, the intestinal lesions had healed. The onset was insidious in forty; by gastroenteric symptoms in eight; by angina in one; by chills in three, and suddenly in eleven. There were rose spots in nine. The fever was remittent in 38, intermittent in six, atypical in six, septic in two, and not stated in two. Epistaxis was noted in thirty-two, chills in sixteen, intestinal hemorrhage in twenty-six, perforation in sixteen, nephritis in eleven, convulsions in eleven, and pneumonia in six. The delirium was wild in twenty-eight, muttering in twenty-two, maniacal in one. In nine the spleen was enlarged. Such complications as bronchitis, pneumonia, peritonitis, cancrum oris, aphonia gangrenous stomatitis, hemiplegia, pulmonary tuberculosis, mitral disease, and endocarditis, helped to swell the mortality. The variety of the fever was severe in fifty-nine, moderately severe in five, and mild in one. Thirty-five were treated by hydrotherapy; three by antiseptics; six by eliminative and antiseptic methods; ten by antiperiodics; and eight by antipyretics. Excessive diarrhea was treated six times: hemorrhage fifteen; nervousness four, and cardiac weakness twenty-seven times.

Treatment. The general management of the cases was of the same character throughout, but the systematic methods of the trained nurse, which superseded the crude ones of the unskilled in the first decade, contributed much to the better results obtained in the second and third periods.

The *diet* which was uniformly liquid during the first three decades, consisted of milk and animal broths, except in two cases in which "pudding diet" was noted. I am not familiar with this last named food for enteric cases, nor was I able to ascertain its full meaning, but I suspect that the patients for whom the pudding was ordered were in the convalescent stage.

In the first decade there were twenty-six patients who were treated as follows:

	Cases.
Cold sponging	5
Antiseptic treatment	1
Antiperiodic treatment	20

It will be seen that twenty received quinine. During this period Liebermeister's treatment was in vogue, and I can recall the large doses of quinine given, which had little effect upon the fever, but often irritated the stomach and increased the nervous symptoms.

In the second decade fifty-nine patients received the following treatment:

	Cases.
Cold sponging	23
Cold pack	1
Antiseptic treatment	5
Eliminative and antiseptic treatment	4
Nervous symptoms treated	32
Antiperiodic treatment	30
Antipyretic treatment	16

Daylight was beginning to dawn on the treatment and the beneficial effects of reducing high temperature by external applications of cold were realized. This change of treatment was not well established when that pernicious class of drugs, the so-called antipyretics, was introduced. Antipyrin was administered in sixteen cases, four of which died. I remember with what pride we gave the synthetical preparations to demonstrate their power of quickly reducing high temperatures. It was quite two years before we realized that, while the temperature was being so beautifully lowered, the necessity for stimulation increased.

Quinine was now given to 50.8 per cent. of the cases and undoubtedly played its part in augmenting the number requiring stimulation.

In the third decade the 252 cases were treated as follows:

	Cases.
Hydrotherapy	213
Antiseptic treatment	33
Diarrhea	4
Heart stimulants	21
Nervous symptoms	1
Antiperiodic treatment	27
Antipyretics	1

In this decade the treatment by the various *intestinal anti-*

septics was introduced, but, after a fair trial, they were discontinued in my service, because I was not convinced that any benefit resulted from their administration.

Twenty-seven received quinine, because of mixed infection, but only four were given antipyretics; phenacetin was given to them to allay nervous manifestations and not to reduce temperature. Of 252 cases, 213 were treated by hydrotherapy. Under this head are included cold sponging, the cold pack, and tubbing after the method of Brand. The *regular* treatment recorded in the tables means one or all of the three methods, according to the indications in each case. About the same number as in the previous decade received stimulants, but for a different purpose. While in the second decade such drugs were necessitated by the cardiac depression from the coal-tar derivatives, now they were given as routine treatment in carrying out the Brand method.

In considering the results obtained in this one hospital during the last decade, it may not be wise to lay too much stress upon figures. The reduction in death-rate may not be due to the treatment, but by comparison with the mortality in preceding periods under different methods it emphasizes the following facts:

From 1892, the beginning of the third decade, to 1898, inclusive, the treatment followed was hydrotherapy, antiseptic, and antiperiodic. During this time eighty-eight cases were treated, ten of which died, giving a mortality of 11.36 per cent. At the beginning of 1899 the purely hydrotherapeutic treatment was begun and has been strictly followed throughout the remainder of the decade, with the result that of the 164 cases then treated eighteen died, giving a death rate of 10.97 per cent. Four cases of the last series died of pulmonary tuberculosis either during or directly following a typical course of enteric fever. We may rightly exclude them from our mortality list—when the death rate will be 8.54 per cent.

Some slight changes in treatment have been instituted during the last half decade. The diet was augmented in nutritive value by the addition of cereals, eggs and bread to the prescribed routine of milk and broths. The patient's ability to digest such "soft food" was carefully watched and only two or three instances were recorded in which the semi-solid food had to be discontinued.

I was rather skeptical at first as to the good results from giving semi-solid food to typhoid-fever patients, but I must confess to a conversion to the method so well portrayed by Shattuck. Realizing that diarrhea is the exception in the child with typhoid fever, one can safely venture the use of liberal feeding. While an occasional case may not tolerate anything but liquid food, the majority will not only relish, but will digest and assimilate soft cereals, and soft boiled eggs. By adopting this method, most of the heart-rending scenes of the sick-room will be avoided. The otherwise patient child no longer begs and cries for "something to eat;' there is no longer progressive emaciation until the little skelton is covered by loose skin hanging in folds; relapses become less frequent; convalescence is shortened; and complete recovery replaces prolonged invalidism.

Our ideas on the Brand method have changed materially in that it was only used in three cases during this last period. Its beneficial effects have been demonstrated, but children do not require such heroic treatment; the sponge bath is quite as effective in reducing temperature, in allaying nervous perturbations, and in stimulating the activity of the emunctories. Intestinal irrigation was recently tried in a few cases, but its beneficial effect is not yet evident.

The table shows the methods of treatment:

	Cases.
Regular	165
Brand	3
Quinine	22
Irrigation	24
Antiseptic	15
Eliminative	3

In concluding, I desire to state that the cases were culled and the charts prepared from many imperfectly kept records, by the assiduous labors of Doctors Grasty, Turner, Riley and Smith in 1903, and by Doctors Ong, Titus, McLaughlin and Durney in 1909. To all of these I acknowledge my indebtedness.

Many doctors of high rank are constant financial bamboozlers. Every move is a grand-stand play. Every case is a serious case. "The call came in the nick of time." Death flew out the back door as the Great Doctor entered the front. Every sore-throat is diphtheria; every belly-ache is appendicitis; every infected finger is blood poison."—*Doctor Betterman, in The Office Practitioner.*

SOME OBSERVATIONS UPON PERICARDITIS IN CHILDHOOD.

BY

F. J. POYNTON, M. D., F. R. C. P., Lon.

Physicians to Out-patients, The Hospital for Sick Children, Great Ormund Street; Assistant Physician to University College Hospital, London.

In making these observations upon pericarditis in childhood, I do not wish to confine my remarks to the rheumatic form but to say a few words also upon suppurative and tubercular pericarditis.

There is little that is new and not generally known about rheumatic pericarditis but the other forms are rare enough to fade from one's recollection and even to escape general recognition; and on this account I have thought it might be useful to touch upon them.

When pericarditis is rheumatic in origin it is, with few exceptions, evidence of a severe infection. If it should occur in a first attack of rheumatism it is a grave event, and I find in my note books among the acutely fatal cases of this disease in childhood a considerable number in which pericarditis occurred in the *first* illness.

As a rule, however, it assails a heart already damaged by previous attacks of rheumatism and by a subacute rather than acute illness deals what may prove a fatal blow to the already damaged organ. It is, I think, important to realize this position of pericarditis in the rheumatic manifestations of childhood; for even now perhaps we are rather too inclined to ascribe a failure of compensation in rheumatic valvular disease to over-exertion. This is undoubtedly a factor, but a much more frequent cause is an exacerbation of rheumatism and sometimes in this exacerbation there occurs a pericarditis local or general. It is very difficult to realize how stealthily cardiac rheumatism may attack a child, and the more I see of this disease the more I am convinced that both the terms acute rheumatism and rheumatic fever impede rather than assist us. I have repeatedly urged as far more scientific the employment of the term rheumatism in a sense corresponding to the term tuberculosis. Let me emphasize also that much of the life history of rheumatism in childhood turns upon the smouldering of the infection in the tissues. Just as there is a great vital resistance to tuberculosis so is there also to rheumatism; but on the other hand there is frequently a damping down, not a complete destruction of the infection in tuberculosis and this is equally true of rheumatism. We must, I believe, all admit that when tuberculosis gets a sufficient hold upon a patient, it cannot be exterminated; life may be prolonged beyond perhaps our expectation but there is a continual lighting up of the old flame. This too is true of rheumatism. We see many cases in childhood which are never really free from exacerbations of the original infection.

General pericarditis may occur with very little discomfort and no pain of note. Wasting, vomiting, fever, pallor and dyspnea on exertion may lead to the discovery of general pericarditis yet the child may not have mentioned pain. Thus it follows that in the rheumatic we can never be sure of the condition of the heart without physical examination.

I want to mention one point in the pathology of pericarditis, the infective process starts in the subendothelial tissue of the pericardium and produces local foci of inflammation. When we say a pericarditis is general we only mean that there are a vast number of these local foci. This explains what is often noticed the appearance of pericardial friction when a pericardium is thought to be generally adherent. Broadly speaking it may be generally adherent, but the adhesion is not so complete as to prevent new foci arising between the old adhesions. In severe pericarditis the cardiac dulness increases greatly, sometimes with much rapidity; but I have never met with a case in childhood which required paracentesis pericardii. I do not deny that such a necessity may arise but I think it is a great relief to know that it is a very exceptional event. The increase in the cardiac dulness we know is almost entirely due to dilatation of the heart and not to effusion into the sac. In this simple fact there lies a great truth. It is the myocardial rather than the pericardial damage which wrecks the heart. I do not wish to be thought to underrate the embarrassment that may be caused by a pericardium lined with fibrino-plastic exudation or the irreparable injury that may result from external adhesions to the mediastinal tissues, but I have no doubt in my mind that the great immediate danger of rheumatic pericarditis lies in the damage that a severe infection inflicts on the neuro-muscular tissue of the heart.

Great damage may also result to the heart wall from repeated attacks of rheumatism which do not cause pericarditis, and we must beware of taking too favorable a view of a case of that kind, and on the other hand a too gloomy view of one in which there is pericarditis. When as is almost always the case there is endocarditis also, we must, after determining the valve or valves affected once more turn to a study of the heart wall and estimate its power of compensation.

When children have had repeated attacks of rheumatism it may be impossible to detect pericarditis although it exists, because there may be adhesion of the pericardium in front and the pericarditis be active only on the posterior surface. In spite of this and guided by the previous statements I have made we judge from the clinical symptoms that the condition is one of gravity; recognizing in the pallor, the dyspnea, the rapid low tension pulse, the excited cardiac action, the wide area of dulness and the turbulent heart sounds the evidences of a severe cardiac infection.

Fever is a usual symptom in pericarditis but I would emphasize that some of the worst cases of carditis show a subnormal temperature. This is interesting from the therapeutic standpoint, for the advocates of the intensive salicylate treatment will tell you that lowering of the temperature by these drugs is one evidence of their controlling influence over rheumatism. I would ask how can this be indisputable, seeing that in the most terrible infections the temperature may be subnormal? We must beware of livid pallor, a running pulse, vomiting and restlessness, they are evidences of deadly infection; and I am amazed when I still see it sometimes stated that rheumatism is an attenuated septicemia in the face of these cases which prove incontestably that this disease may be most virulent and deadly.

We can distinguish two dangerous forms of pericarditis acutely virulent, in which the effusion may be hemorrhagic and the relapsing obstinate form which kills slowly but surely.

Though you may judge from my remarks that I look upon pericarditis as but an accident in rheumatism, you will not suppose that I underrate its importance, its occurrence constitutes a landmark in the history of a case. We must remember too that it may occur as part of a primary carditis or associated with any manifestation of rheumatism. The cardinal features are fever, precordial pain, dyspnea, wasting and anemia, a rapid low pressure pulse, and excited, dilated heart. Pericardial friction is the rule, and endocarditis almost invariable. Pleurisy and other respiratory complications are frequent. I have read that rheumatic pleurisy is rare, as a solitary manifestation this is possibly true in cases of severe carditis it is very frequent. I have seldom seen a fatal case without pleurisy being discovered at the necropsy. The base of the left lung often shows marked changes in pericarditis. This is a result of the cardiac dilation and is recognised clinically by impairment of the percussion note, bronchial breathing and crepitation. In addition to this patches of rheumatic broncho-pneumonia are not very rare. In experimental rheumatism they are common. A rare but very interesting complication is an acute edema of the lungs resembling the acute edema of renal disease, but occurring without any gross renal changes. As in renal disease so in these cases the first signs are sharp rales in the upper lobes of the lungs which rapidly spread and become general. It is a most dangerous complication but not always fatal. I look upon it as indicating the immediate use of stimulants and the abandonment of all depressing remedies. I have seen three of these cases, two of them proving fatal.

Thrombosis of the large veins in the neck and upper extremities may occur and even the superior vena cava may be occluded by clot. I have seen seven cases of these thromboses during active carditis and I believe there is a rheumatic phlebitis. An acute edema of one side of the face or of one upper extremity should put one on the alert for this complication, especially if there is tenderness along the course of the great veins. When I find delirium associated with pericarditis in childhood I am always suspicious of chorea.

Although pain is sometimes conspicuous by its absence it may be very severe and is then usually associated with sudden attacks of cardiac dilatation, more rarely with ante-mortem prediastinitis, thrombotic mediastinitis or diaphragmatic pleurisy.

Two conditions strike me as difficult to distinguish from rheumatic pericarditis one is a to-and-fro, soft, aortic murmur, the other an excited and much hypertrophied heart in chronic valvular disease; this latter often gives rise to a churning sound which is easily mistaken for friction.

Rheumatic nodules are local infections of the tendon sheaths and subcutaneous tissues and though they may sometimes occur in numbers in a case where there is little or no cardiac disease, the late Dr. Cheadle's doctrine is still the safe one that they as a rule mark a severe infection.

The duration of rheumatic pericarditis is most uncertain and we should make a great mistake if we calculated it from the duration of the pericardial friction. We are not guided by this but by the behaviour of the cardiac wall. We may certainly encourage the parents with the news that the friction has subsided, the pulse rate fallen, the heart regaining its proper dimensions and the temperature falling, but we cannot deny that exacerbations are frequent enough. Even if there is no exacerbation we can only judge of the duration of the case by the response the heart makes toward recovery. The illness we call pericarditis does not by any means end with the acute inflammation of the pericardium.

In fatal cases of pericarditis the actual death may be sudden but I think it is rarely unexpected; the ghastly pallor, rapid heart, feeble pulse, wasting and restlessness generally warn us that recovery is hopeless although the end may be sometimes prolonged for longer than we thought. Unfortunately we meet with cases which, though they may never look like succumbing in the first attack and which may rally in a surprising manner for a time, never recover beyond complete invalidism. In hospital practice these cases are among the saddest of all we encounter. Yet sometimes there is a perfect recovery and not even endocarditis.

At the present time the treatment of rheumatic pericarditis is unsatisfactory, and I am going to make the heretical statement that the use of salicylates is in part to blame for this. If it were not for these drugs we should, I believe, have many more investigators working at the subject of rheumatism in this country. It is impossible for a few individuals to cope with the far reaching problems connected with this disease, and it is surprising when you realize the amount of investigation that is carried on in these days that this disease has not attracted more attention.

I think the view that salicylates are a specific for acute rheumatism has lulled us into a sense of false security though I may at once state that no sera that I have used have encouraged me to advocate their use. They have been apparently harmless, but I cannot say of any real value but this experience is a very small one, and does not deter me from seeking hope in this direction.

You are all aware of the intensive treatment of rheumatism by the combination of salicylates with alkalies. I have seen much of this treatment and I have wished to believe in it, for it matters not at all what the cause of rheumatism is, if we can cure it by a specific drug. There is however a cardinal rule in the treatment of children's diseases to the effect that children do not tolerate powerful drugging, and for my part I can see no sufficient reason for departing from this rule for the salicylates. I will go even further and say that to give a delicate, highly strung rheumatic child with active heart disease, massive doses of salicylates is dangerous, and in my belief harmful. In spite of all statements to the contrary I also maintain these remedies are depressing, and to some patients very much so, and that the depressant effect can be distinguished from the debilitating effects of the active rheumatism itself.

I have never seen in acute rheumatism the intense nausea, general muscular languor, greenish pallor, slow halting pulse, intense mental depression, and frequent micturition that I have noticed in salicylate intoxication itself. There is in my opinion a different atmosphere about such cases, to that of severe cardiac rheumatism itself. More than ten years ago in the Encyclopedia of Medicine I emphasized the occurrence of vomiting, air hunger and coma in fatal salicylate poisoning.

Let me add that I do not deny that the salicylates are valuable remedies in rheumatism, particularly for the arthritis and pains but the weak point in the argument as to their specific action appears to me to be this. Rheumatism damages by forming numerous local foci in the various tissues and does it follow that the toxic bodies that are formed in the heart and in the brain, for example, are identical with those formed in the joints? It is not a question of some rheumatic poison bathing all the tissues to be neutralised by sodium salicylate, but of local productions of poisons which need not be and probably are not identical. The chemical composition of the tissues vary and the pathological chemistry must surely vary! I cannot accept for one moment a comparison between the action of quinine in malaria and salicylates in rheumatism for there is no resemblance between the malarial parasite and the diplococcus of rheumatism. What cycle of changes do we find in the streptococci comparable to the life history of the malarial parasite? The two diseases I shall always maintain are in their clinical characters utterly different. Nevertheless I would at once discard all my beliefs and theories if clinical observation gave decisive proof to the contrary; but I maintain that the great fact that clinical medicine does teach us, is that the salicylates so useful in acute arthritis and muscular pains fail, whether in large or small doses, to arrest rheumatic carditis or chorea with such decision as to show their specific action.

Regular and careful feeding with light digestible food is of much importance in pericardititis and careful watch must be kept on the bulk of fluid lest we dilate the stomach and embarrass the heart. In lingering cases I feed the child as liberally as is consistent with the digestive power and temperature and I have long given up any fear of the meat foods in the rheumatism of childhood. That belief is I think a survival of an old and crude pathology.

Among the most fragile of all our patients are some of the rheumatic children for they are delicate in build and highly sensitive, and we cannot be too gentle and careful with them. It is as useless and meddlesome to disturb a bad case of pericarditis with frequent examinations as it is a bad pneumonia.

Small doses of opium or morphia are of such great value because they calm the distress and aid sleep. Strychnine I do not advocate when the heart is very excited, but I think it is indicated when there is feebleness rather than excitement.

For precordial pain when severe the ice bag as advocated by Dr. Lees is most valuable when we have good nurses to help us. If as I believe there is more effusion than usual I order blisters but do not use them as routine measures, when the small doses of iodid of potasium are indicated to promote absorption of exudations. When the right heart is in difficulties, as shown by the troubled epigastric impulse, small radial pulse, dulness to the right of the sternum and engorged and tender liver, leeches are helpful. If there is vomiting and the food is undigested I pay entire attention to limiting this as soon as possible. Children soon fail if they cannot take food and do not sleep. Stimulants are particularly useful in this class of cases.

Convalescence is a most important question. We have to face this in a practical spirit; for although we know what we want we often cannot get it. There is expense to be considered, suspicions of a desire to make a long illness to be encountered, and the frequent interference of anxious friends with new suggestions. Nevertheless with the gradual spread of knowledge that rheumatism in childhood is infective, it becomes yearly more easy to make parents understand that an inflammation around and in the heart must soften it, and that in order to make it competent to bear the strain of ordinary life this softening must be recovered from.

They can see too that the testing of this recovery must be gradual and not sudden; and many will realize after quiet discussion that the question is not one of the immediate but of the entire future of their child's life.

It is certain that after the temperature has reached the normal line and all friction has disappeared that we ought to take no forward step until the diminution in the precordial dullness has reached its limit of recession. This accomplished we know that the stage of acute dilatation is over. When the pulse becomes steady we recognize that the heart is settling down. The cessation of fever, recovery from the dilatation, and improvement in the pulse may take weeks, but however long it takes I believe we can do no good by ignoring these three indications. Taken singly they are not of the same value, it is their combination which is so valuable. We have next to watch the impulse. This should become better defined and often more thrusting. If, as is almost always the case, there has been endocarditis we learn from this thrusting impulse that some hypertrophy is needful to compensate the valvular lesion when the child is at rest.

The next step is the extra pillow, and when the weather is fine and warm and the bedroom easy of access, it is a great gain for these children to lie out in the open air. Step by step we gauge progress by temperature, pulse, impulse and cardiac area; and we know that six months is well spent in this convalescence. These can be made happy and useful months and we can train the heart by careful massage of the limbs, resisted movements, walking on the flat, up gentle inclines and by Swedish exercises. Stairs come last. Small doses of digitalis are useful, I think, during the convalescent stage, as a cardiac tonic. Later mild iron and arsenic preparations or tonic doses of quinine. In the cold weather the thin, nervous child does *well with* cod liver oil.

Suppurative pericarditis in childhood is a very fatal disease: The cases which I think most merit attention are those of pneumococcal origin. These cases are seldom uncomplicated; in fact I doubt whether an uncomplicated pneumococcal pericarditis occurs in a child except as a curiosity. Over 90% are associated with empyema, pneumonia and pleurisy, but I do not think it follows as has been assumed that the pericarditis is secondary in the sense that there is direct extension. I believe there is a multiple infection and this is supported by the finding of suppurative meningitis in 15% and suppurative peritonitis in 10%. About 80% of all cases occur in children under four years, and $\frac{2}{3}$ in children under three; so we may call it essentially a disease of very young children, and let me insist upon this contrast between it and rheumatic pericarditis.

The diagnosis of the condition is almost impossible because friction is rarely heard in about 6%—is the average. Then again the pulmonary signs distract our attention, and in only about 1% does endocarditis occur, which if it were more frequent would certainly direct our suspicions to the heart. Contrast this with an analysis of 150 fatal cases of rheumatic fever in childhood, in which 149 showed some va vular disease.

This form of pneumococcal pericarditis may follow infections such as whooping cough, measles and influenza and they run a very variable course. As it is practically impossible to diagnose the pericarditis in many cases even when established, it is even less possible to ascertain when it commences. Accordingly in judging of the duration of these cases we must be content at present to know the duration of the entire illness which, as I have already said, is usually at first ushered in as a pneumonia, empyema or pleurisy. These illnesses may run a course of from four weeks to about twelve months; the average is between one and six months. When the pericarditis arises in a case who can say; but there is a certain amount of pathological evidence to prove that it may sometimes be of long duration, much longer than I, for my part, ever suspected.

We are most likely to detect these cases either when there is friction, or when there is a large effusion, and in the latter case the X-rays may help us. Unfortunately the majority are characterized by a small effusion, and the tender age of the child adds to our difficulties.

We suspect these cases when in spite of appropriate treatment of the pneumonia or empyema the pulse remains rapid; there are panting attacks, outbreaks of fever, orthopnea, syncopal attacks and livid pallor with great illness.

The only treatment that I can think could be of real value is the discovery of a curative serum. Surgery may save a life occasionally, the more honor to the surgeon, but the vast majority cannot be treated in this way.

Lastly a few words about tuberculous pericarditis. This I am convinced is rare, but not quite so rare as we think. For teaching purposes I divide them into two groups, in one there is much effusion which is clear or blood-stained, in the other there is dry pericarditis with friction. The clinical signs are, I think, indistinguishable from rheumatic pericarditis, and there may be accompanying endocarditis.

We must also remember that in some cases of tuberculosis a chorea occurs indistinguishable from rheumatic chorea, and an arthritis indistinguishable from rheumatic arthritis. As a rule, however, we do not get manifestations of rheumatism, but evidences of tuberculosis. Some of these cases develop complete adhesion of the pericardium with tubercular pleurisy and peritonitis, or they may develop ascites with an enlarged liver and spleen secondary to the adherent pericardium. These very remarkable cases, which have been well studied in America has run a protracted and sad course, with continual outbreaks of pleurisy, peritonitis or local pericarditis.

Recurrent serous effusions are frequent and all the cases I have traced to the end have died of tuberculous meningitis. One most remarkable case of mine which, I believe, is almost certainly tuberculous was operated upon by my colleague, Mr. Trotter, for the adherent pericardium by the method of cardiolysis first initiated by Brauer. He is alive and in fair health now, almost two years later, although he had a few months ago a pleural effusion for which paracenteses was required This, however, is a most exceptional and brilliant case. Much more often we should find that if the child survived cardiolysis, the tuberculous powers in the pleura and peritoneum would stultify much of the advantage obtained by freeing the pericardium from the chest wall. Again if the chest wall is very flexible as it may be in young children, we gain little by the operation and risk much at the time of its performance.

COMMON ERRORS IN INFANT FEEDING.

BY

ERIC PRITCHARD, M. A., M. D. Oxon., M. R. C. P. Lond.

Assistant Physician to the Queen's Hospital for Children; Hon. Physician for Infant Consultation at the St. Marylebone General Dispensary, etc.

Errors in the feeding of infants, and the catastrophes that follow, are by no means confined to artificial methods; they are equally common among infants brought up on the breast. In the following pages I shall try to analyze some of the causes which lead to the disasters which are attendant on both systems of feeding.

It is now some fifteen years since I published in one of our medical journals a short account of a new method of feeding infants, which has since become known as the American or percentage system. I entered whole-heartedly into the method, and was rewarded with a series of successes, the like of which I could not have anticipated from my previous experiences with the current systems of feeding. The theory on which this method was founded appealed strongly to me, for it admitted the individual requirements of different infants, and professed to supply them by exercising a complete control over the various elements of which an infant's dietary normally consists. The theory premised that different animals, and, indeed, different individuals, required for the performance of their various functions certain stated quantities of the main food elements, namely proteids, carbohydrates, and fats. Proteids, were mainly required for the purposes of growth and the repair of tissues, carbohydrates were required for the performance of work, and fats chiefly for the production of heat. Inasmuch as different individuals grew at different rates, performed different amounts of work, and existed under diverse temperature conditions, it followed, from the terms of the theory, that no uniform food could fulfil the required physiological conditions in a series of cases. The aim and object of the percentage method was to adjust the nutritive supply to the nutritional requirements. It was clear, therefore, that if cow's milk was adapted to the nutritional requirements of the calf it could not also satisfy the needs of the human infant, and no amount of dilution could make it do so. It was claimed, however, that the food elements which existed in cow's milk could be separated by analysis and re-combined by synthetic methods in the required proportions, and the results of the method have proved abundantly that this is true. And from this aspect, if the method fails it is the fault of the individual who employs it and not of the method. I frequently see it stated by authorities, who, in my opinion, might be expected to take wider views, that the percentage method is inferior to the old methods of milk dilution; this is tantamount to saying that guess-work is better than a certainty, for the percentage method enables us to employ with accuracy any degree of dilution we please.

The infants with whom I had my early successes were all over one month of age. Some had been breast-fed, others had been brought up on the bottle, but all of them were failures in some respect, or otherwise I should not have thought it necessary to interfere with the method of feeding, but the moment I attempted to apply the same method in the case of new-born infants the disillusionment came, and I had to confess that the system had been weighed in the balance and found wanting.

Why did the system succeed in the case of older infants and fail in the case of those under one month of age. The answer to this question was unexpectedly supplied me by a maternity nurse who had worked for me and who was quite enthusiastic over the new method. She told me that she found her cases did much better when she peptonized the milk mixtures for the first few weeks of life. This, then, was the secret of my own failures, and I set to work to study why Nature did not fail in the same way. I knew perfectly well that Nature did not peptonize the human infant's food, although instances were not wanting in the animal kingdom, namely among certain varieties of birds, in which the artificial act of digestion was performed by the parents before the food was given to their young. However, when I came to examine the character of the food which Nature supplied to the new-born infant, I had to acknowledge that if it was not exactly peptonized it was at least of a compositon that required little or no digestion before it could be absorbed from the alimentary tract.

During the first few days of the puerperal period the mammary secretion, or colostrum, is extremely scanty in quantity; it is non-stimulating, non-coagulable, and yet adequately nutrutious for the then existing requirements of the nursling. In fact it is exactly the sort of food that on theoretical grounds ought to be supplied to a small, sensitive, and undeveloped digestive organ such as is the stomach at the time of birth. To indicate how nicely adjusted colostrum is to the physiological needs of the new-born infant, I may mention that the sugar which it contains is capable of immediate absorption without any alteration in the digestive tract of the infant. The sugar of colostrum is dextrose and not lactose, the milk sugar by which it is replaced after the establishment of full activity of the mammary gland. Before lactrose, which is a poly-saccharide sugar, can be absorbed with nutritional advantage by the human organism, it must be digested or split up into its mono-saccharide components—dextrose and galactose—by the action of an inverting ferment (invertin). At the time of birth no such ferment is present in the alimentary tract, or, if present, it only exists in very minute traces. Nature therefore provides the new-born infant with a mono-saccharide sugar (dextrose), which is immediately available for absorption and for the purposes of nutrition.

The chief function of the fully developed stomach is to act as a reservoir for the reception of solid food elements, and to cooperate with the masticatory organs in disintegrating and rendering soluble the solid material of which our food usually consists. The pyloric sphincter acts as a guard to the intestines, and prevents large particles of food from gaining access to the highly sensitive mucous surface of the duodenum. At the time of birth the pylorus is extremely sensitive, and liable, especially in spasmophilic subjects, to become forcibly and tonically contracted when solid particles attempt to force a passage. For this reason Nature provides the new-born infant with colostrum and not with milk, for the former, unlike milk, is a bland, non-coagulable fluid.

The transition from colostrum to coagulable milk is relatively slow; it may be ten days or more before the mammary secretion assumes the characters of a true milk. During this time the stomach has been functionally developing, acquiring tolerance to the presence of coagulated casein, and learning to peptonize or liquefy the clot soon after its formation. There can be no evasion or short-circuiting of this route, tedious and slow though the journey be; attempts to do so are calculated to lead to disaster, and that is why new-born infants who are started in life on the statutory mixtures of one part of milk and three of water, or on the most approved percentage combinations, so often fail to do justice to the method of feeding.

In the year 1895 I had my attention forcibly directed to the association between hypertrophic pyloric stenosis and undue stimulation of the stomach by excessive quantities of diluted milk. The case (1) to which I refer presented what are now recognised as the classical symptoms of hypertrophic stenosis of the pylorus, but at that time the condition was practically unknown, and it was only at the post-mortem examination that the stenosis and hypertrophy of the sphincter were found to be an adequate explanation of the cause of death. Since this early case of hypertrophic pyloric stenosis I have never met with a genuinely typical case, although I have frequently met with cases of pyloric spasm from the same cause, which might have developed into the severer forms had the condition not been recognised and appropriately treated.

Accidents of this kind can always be avoided by providing the new-born infant with a food which approximately resembles colostrum in its physical characteristics, and it is to the fulfilment of this condition that patent and proprietary foods owe their popularity. Allenbury food No. 1, for instance, is admirably designed as a substitute for colostrum; it is pre-digested, non-coagulable, non-irritating, and adequately nutritious, but the very features that make it so excellent a substitute for colostrum are the very features which render it a most pernicious substitute for human milk. No pre-digested, non-coagulable food like Allenbury No 1 can be expected to develop the digestive functions of the stomach and alimentary tract. Nature does not provide the infant at or about the tenth day of life with a coagulable food like milk without a good and sufficient reason. She could not adopt such a paradoxical expedient as to give a liquid food by the mouth and render it solid in the stomach a few minutes later without intention and design. The reason, of course, is to gradually educate or train the stomach to liquefy solid food before the stage of weaning arrives, when the infant is often called upon to subsist "on the same food as we eat ourselves."

It would be quite inconsistent with my attitude of disapproval towards patent foods in general if I allowed it to be thought that I advocated Allenbury No. 1 or any of its congeners as a substitute for colostrum. I can conceive of no better food for the new-born baby than simple undiluted whey prepared on the ordinary domestic plan from fresh milk and rennet, or more economically, and just as satisfactorily, from separated milk. Such a food is non-stimulating, non-coagulable, and adequately nutritious. Further, it may be made the instrument of digestive education by adding very slowly the food elements which develop the special digestive functions of the stomach—that is to say, a coagulable proteid such as caseinogen, and an emulsified fat such as cream. The details of the method are extremely simple and the results highly satisfactory.

For fear of being thought to exaggerate I hesitate to say how many cases of wasting and dyspepsia I see every week which can be explained on the ground that the teaching of the colostrum period has been disregarded. In addition to that enormous number of infants who within the first week of life are fed on diluted cow's milk, and who never recover from this initial mismanagement, I see infants who have not even learnt to digest their own mothers' milk suddenly confronted with the still more indigestible milk of the cow, and in my private practice I meet with wasting infants who immediately after birth have been submitted to the tender mercies of a wet-nurse in full lactation. If the healthy infant cannot be expected to short-circuit the colostrum period, how much more improbable is it that a delicate and degenerate infant, on whose life perhaps much depends, will be able to dispense with simple lessons in digestion, and learn to run before it can walk!

In my opinion no new-born baby should be provided with a wet-nurse until it has served an appropriate apprenticeship, such as I have already described, on an artificial substitute for colostrum. The fact that a few babies manage to "muddle through," apart from such a probationary experience, is no argument against the adoption of the more scientific, albeit more troublesome, method!

I do not hesitate to say that an infant can be taught to digest almost any food, provided that sufficient time be given, and that the stages of immunisation are adequately graduated. I believe that it is expedient to teach all artificially fed infants to digest cow's milk, and I hardly ever come across a genuinely refractory case, but sometimes the necessary steps to secure this end are undeniably slow. For instance, if a baby has been brought up for three months on Allenbury No. 1, it may take a month to teach it to digest a diluted cow's milk appropriate to its age, but the lesson can always be learnt if at first a few drops, say, five, of cow's milk are added to each bottle, and the subsequent increments are correspondingly minute. I am frequently much annoyed, when infants who are being successfully treated by this method, but not fast enough to please the mother, are suddenly, and generally on the advice of some interfering friend, put upon the statutory milk mixtures. The result is a foregone conclusion, and the whole process of education has to be commenced afresh.

To revert now to a different and fertile source of error in the feeding of infants, I propose to describe some of the mistakes which are made in the quantities of food which are supplied to infants. In artificial feeding such mistakes are common enough, but, owing to recent improvements in the technique, they pale into insignificance when compared to the mistakes which occur in cases of breast feeding.

It is a necessary provision of Nature that there should be some sort of co-ordination between the supply on the part of the mother and the demand on the part of the infant. The strong, healthy infant, by reason of its active powers of suction, affords the appropriate stimulus for a parallel activity on the part of the secreting gland, while the feeble nursling, in conformity with its indifferent powers of stimulation, excites little reaction in the breast from which it draws its sustenance. The late Professor Budin (2) proved this association over and over again; he found that while the weakly nursling was often incapable of imparting sufficient stimulus to keep a mammary gland in active secretion, a single wet-nurse could successfully feed four or five infants by reason of their united efforts.

Nature, however, does not always pursue her perfect way, and in a very considerable proportion of cases there is no co-ordination between the supply and the demand; sometimes there is too much milk, sometimes there is not enough. Apart from the physiological test, namely the progress of the infant, the only means of ascertaining whether an infant receives enough or too little milk is to employ the method to which I have provisionally given the name of the "test-feed." This method consists in weighing the infant before and after feeding on very accurate scales; the amount consumed is estimated by noting the difference in the two weighings. The physiological test is a very valuable one, and it can be confirmed and substantiated in some degree by noting the amount of urine that is excreted and by the character and quantity of the stools. Further, the size of the breast before and after feeding affords some sort of index of the amount of milk which has been abstracted by the infant; but in spite of these several indications, I assert with the greatest confidence that there is no man living who can give even an approximately accurate estimation of the amount of milk an infant receives at a breast feeding. I can no more trust my own judgment in this matter than I can that of the infant itself.

The following case illustrates the kind of mistake that can be made by experienced people, and the great value of the weighing method: A baby (A. B—), was brought to my "infant consultations" at the St. Marylebone General Dispensary on January 17, 1907, with symptoms of obstinate constipation and loss of weight. The mother had been confined on January 4th at a well-known maternity institution in London, and the infant had been put to the breast regularly ever since. At birth the infant weighed 7 lbs. 10 oz.; it now weighed 6 lbs. 14 ozs.—a loss of 12 oz. in fourteen days.

The nursling, though somewhat thin, was in good condition, had a good color, and had never been sick. I suspected underfeeding from the symptoms, but was surprised to find the mother's breasts well developed, and affording the usual stream of milk on compression of the nipple. A test-feed was arranged, and after waiting two hours since the last feed, the infant was put to the breast. The scales proved that the infant obtained less than two teaspoonfuls of milk. I therefore ordered the mother to give the baby one ounce of whey and twenty drops of cream alternately with breast feedings. During the following six days the test-feed showed that the amount of breast milk did not increase, but, all the same, the infant recovered part of the loss in weight, for on January 24th it weighed 7 lbs. 4 oz.—a gain of 6 oz. The whey and cream mixture was increased on January 24th to one and a half ounces of whey and thirty drops of cream, and the mother, who was very anxious to nurse her baby, was encouraged in every way to persevere with breast feeding. On January 28th, that is to say, four days later, the scales registered a gain of half a pound in weight but the test-feed still proved that this gain was in no way due to breast feeding, for the infant only abstracted one teaspoonful of milk from the breast. On February 4th the infant had gained a further half-pound in weight, but now the test-feed proved that the infant was obtaining a full amount (3 oz.) from the breast. The whey mixture was consequently suspended, and the infant continued to make uninterrupted progress; in fact, he proved to be a particularly fine baby, and was one of the prize-winners at our 1907 baby show.

This case is of peculiar interest, because it shows that with patience and perseverance an apparently non-active breast may ultimately secrete a good supply of milk provided that the infant can supply the necessary stimulus, and that the psychological factor is called into requisition. Encouragement on the part of the doctor and confidence on the part of the mother are most important elements in the treatment.

I frequently have infants brought to me for treatment who have been artificially fed from the first week of life onwards, owing to the belief that the breast milk had "dispersed" or "dried up" on the fourth or fifth day, and I regret to say that a considerable proportion of these cases come from maternity institutions or from maternity wards in hospitals.

As far as my experience serves me, there is no criterion by which we can judge during the puerperium whether a woman is capable of ultimately secreting a good supply of milk or not; and, further than this, I am prepared to say that there is no medical man living, however skilled in maternity work, who can estimate, apart from the test-feed, whether an infant extracts a small quantity of milk from the breast or not. It must be remembered that during the colostrum period, which often extends over ten days, the amount of fluid secreted by the mammary glands is under normal conditions extremely limited. Why the milk is so often thought to "dry up" on the third or fourth day is because at or about that time the breasts, which have previously been hard and congested, often become soft and smaller owing to the resolution of the constituent gland-cells into a colostrum-like secretion, which is extracted by the infant, and not always immediately replaced by the anabolic activities of the gland.

To show how mistakes in this connection may arise, I will again quote the case of an infant who was born in August last in one of our maternity institutions. The baby was brought to my consultations at the end of November; it was bottle-fed and doing badly. I asked the mother why she was not nursing it. She told me that her milk had disappeared on the fourth day, and that the authorities in the institution had told her that she must bring the infant up on the bottle. The infant was consequently supplied with a diluted milk mixture, and hence the present trouble. But the interesting part of this case was that the mother, under the impression that she would thereby avert a second pregnancy, surreptitiously put the infant to the breast at night, and had continued to do so ever since. I asked her whether she thought this practice was of any advantage to the baby, but she told me that she knew it was not, as she had no milk. More out of curiosity than for any other reason I ordered a test-feed to be given there and then. To my surprise, and to the mother's surprise, the weighing proved that the infant had extracted from the breast 3 oz. of milk. I promptly ordered a suspension of the artificial feeding, and when I saw the infant last it was flourishing on breast feeding alone.

Since I have systematically adopted the method of the test-feed I have had some strange experiences, and I have been forced to modify many of my preconceived views with regard to the nutritional possibilities of the human infant. I find that among breast-fed infants it is not those who are inadequately fed according to accepted scientific data who suffer from malnutrition, but for the most part those who receive an adequate or an excessive amount. I have not had one, but fifty cases, in which the infant has appeared to thrive well and to maintain a good weight curve on a half and sometimes on a third of the quantity of food that should be prescribed according to our scientific criteria; for instance, it is quite a common experience to find that an infant three or four months old is fed ten times in the day, and only obtains from 1 to 1½ oz. of milk at a feeding, or about 12 oz. in the twenty-four hours.

I am glad to say that evidence from an independent source supports these statements, for they are indeed hardly credible; Dr. Ronald Carter, who also employs the method of the test-feed at his infant consultations in North Kensington, has come to precisely similar conclusions.

However interesting it may be from an academic point of view that infants thus manifestly under-fed can maintain an apparently good condition of nutrition, it cannot be denied that there are advantages from other points of view in expanding the metabolic experiences of such infants. It is a clear gain to any infant to possess active and vigorous metabolic processes, but a starvation diet of this kind is hardly calculated to promote an active nutrition, an active digestion, or good reserve powers of metabolic accommodation. In fact when the evidence of the test-feed proves that an infant is apparently maintaining its nutrition on a manifestly low diet, I always make a practice of supplementing the defective supply with additional feeds from the bottle. Incidentally I may remark that the ordinary methods advised for increasing the breast supply itself are not encouraging, but I find, after very considerable experience, that full doses of iron, in the form of Blaud's pills, distinctly improve both the quantity and the quality of the milk.

When supplementary feeding from the bottle is necessitated owing to a deficient supply of breast milk, the evidence of the test-feed is of the greatest importance in guiding us as to the quantity of food that should be given artificially. An infant five months old, and accustomed, for instance, to 2 oz. of breast milk at a feeding, would almost to a certainty be upset if the statutory allowance of 4 or 5 oz. of modified cow's milk were supplied from the bottle. The normal allowance should ultimately be arrived at, but only gradually by small additions. A large number of infants have their digestive and metabolic processes disturbed for want of this simple precaution, and the same is, of course, true when at the time of weaning artificial feeding is substituted for the breast.

If errors with respect to the total quantity of food bulk very largely among the common mistakes both in natural and artificial methods of feeding, those with respect to quality can produce results which are equally serious. Thanks to the careful methods of American observers who have adopted the percentage system of feeding, quite a large number of symptoms, both digestive and nutritional, have been referred to definite mistakes in the qualitative "make-up" of the food. In this country we have been slow to appreciate the advantages of the method, while in Germany and France it is still almost unknown. In Germany, however, during the last few years new interest has been infused into the whole subject of accurate infant feeding by the work of Czerny, Keller, and Finkelstein, and the coining of a new word, "food-injury," to express the damage inflicted on the organism by normal constituents in the diet, has, as is so often the case with catch-words and catch-phrases, done more for the cause in that country than all the combined work of the American pioneers.

The food-injuries of Czerny, his fat-injuries, his sugar-injuries and his proteid-injuries are the old familiar fat, sugar and proteid dyspepsias of Rotch and Holt but writ large, and in capital letters.

In a recent series of papers (3) on food intoxications in infancy, Finkelstein had developed and extended the theory of food-injuries, but unlike most American authorities he entrusts the leading *roles* in the tragedy of errors to fats and carbohydrates, and not to the proteid elements of food. Without denying Finkelstein full credit for emphasizing the disastrous effects of excess of fats and carbohydrates, certain of which effects Dr. E. H. Colbeck (4) and I pointed out as long ago as 1900, I cannot help thinking that he has utterly under-estimated the dangers that are to be anticipated from excess in the normal proteid constituents both of human and bovine milk.

In the earlier pages of this paper I insisted sufficiently on the injuries that may result from giving the new-born infant varieties of proteid food to which it is unaccustomed, and in the digestion of which it has not been adequately trained. I would now further point out that if proteid matter, owing to excessive quantity, is not digested normally in normal situations, it is digested abnormally in abnormal situations by bacterial agencies, with toxic results that are well known. It is all very well for Finkelstein to belittle the influence of bacterial infection in the determination of infantile symptoms, but bacterial infections, perhaps of autogenetic origin, will always dominate the situation when there is excess of nitrogenous food in the bowel, for parasites always congregate where they can make a living; where the carcase is, there are the vultures gathered together.

But quite apart from considerations of excess of proteid the influence of foreign, or new forms of proteid on the infant organisms, is always a factor that must be reckoned with. Even at the present day, despite the brilliant work of Emil Fischer and his school, there are still whole classes of proteid bodies of the nature of albumoses, polypeptides and toxins about which we know very little. It is, however, almost certain that many of these bodies are to be found in human milk, and perhaps to a lesser degree in cow's milk, and that some of them possess serious toxic properties. The milk of menstruating women and of epileptics is generally toxic, and before now such milk has proved actually fatal to the infant who has consumed it. But ordinary chemical analysis of milk will no more reveal the presence for character of its contained poisons than ordinary chemical analysis will indicate the physiological distinctions between antidiphtheritic serum and staphylococcic vaccine.

I have frequently been called upon to treat breast-fed infants, who have presented severe toxic symptoms although nothing abnormal could be detected by the ordinary methods of investigation in the quantity or quality of the milk; and the same infants have subsequently progressed normally on cow's milk modified to the same chemical standard. Such conditions—and they are extremely common—cannot be due to Finkelstein's fat-injuries, nor yet to his carbohydrate injuries; they are due to albuminoid intoxications, for which at present we have no reliable test, except the somewhat expensive one, the physiological reaction of the infant. To imagine that the chemist with his analytical methods can give a reliable report on the physiological quality of a sample of human milk, is to endow him with claims to genius to which he is not at present entitled.

Many of the food-injuries inflicted on the infant organism are so long deferred and so remote in their consequences that their connection with initial mistakes in feeding is exceedingly likely to escape notice. Finkelstein has established this connection in the most unmistakable manner in the paper to which I have already referred. I do not propose on the present occasion to prolong this article by traversing the same ground, but before concluding, I propose to refer briefly to certain food-injuries which are related to initial, and perhaps remote, mistakes in feeding.

Vomiting in infants nearly always represents a food-injury, but this symptom is more often the deferred result of some initial mistake than due to the method of feeding which is in force for the time being. The habit of vomiting is very easily acquired; it becomes, in fact, an automatic reflex so sensitive and so insistent, that, no matter what be the nature of the food, it is rejected by the stomach with the same persistency as that exhibited by the cow in rumination. Infants who have acquired this habit from injudicious methods of feeding during the time that the nerve-centres concerned are exceedingly plastic and impressionable are unavailingly treated by changes in the diet, or by full doses of bismuth and soda.

The only scientific method of treating such a condition is to attempt to break the automatic nature of the habit by temporarily exhausting the centre, or by dulling its sensibility to stimuli which reach it through the stomach. For the prupose of dulling the centre, such drugs as chloral, bromide, or chloretone are distinctly useful. As soon as the habit is broken the remedy may be suspended.

During the last eighteen months I have been trying a method of exhausting the centre, which has afforded most encouraging results. The method is to give a harmless emetic, such as vinum ipecacuanhae and carbonate of ammonium, about half an hour before feeding. After the violent stimulus of the emetic the stomach fails to respond by vomiting to the milder stimulus of food. I have employed this method in fifty-five cases; in thirty the cure was immediate and permanent, in ten the symptom was ameliorated, in five there was no improvement. In using this method it is of course essential that other causes of vomiting, apart from habit, should be excluded; it is quite possible that a wrong diagnosis was made in some of my unsuccessful cases.

Again, with respect to diarrhea, treatment is often the reverse of scientific; it generally consists in supplying mixtures of bismuth, chalk, and opium, and in changing the food from milk to a thin paste of arrowroot and water given frequently and in small quantities.

Diarrhea usually represents a protective reaction on the part of the organism to relieve a wounded organ, namely, the intestine, of material which has inflicted the damage. A wounded intestine ought to be treated as surgeons treat wounds in other parts of the body—by asepsis, and by rest. As long as food is taken the intestine cannot be at rest, neither can it be in a relatively aseptic condition. The treatment of acute diarrhea by irrigation of the bowel with large clysters of very hot water, by the suspension of all food for twenty-four hours or more, and by the exhibition of opium and brandy, is so uniformly successful that I am at a loss to understand why recourse should be had to any other line of treatment.

Chronic diarrhea, in which the stools contain milky-white particles of what is popularly supposed to be the undigested clot of casein is usually treated by suspension of milk, and by the substitution of some other sort of food. I would only remark here that these white particles are not undigested clot; they are coiled-up flakes of mucus, and represent a deferred lesion due to a food-injury. This can be proved by picking out a few of the most characteristic pieces and by testing them out in a bowl of water, when flakes of mucus or mucous membrane will be found. When such particles appear in the motions the condition is one of chronic colitis, and as such it should be treated—not necessarily by suspension of milk.

In the treatment of chronic constipation I have myself been a serious offender in the past, for I have attempted to combat the condition with increasing percentages of fat. In the early days of percentage feeding this was considered the rational line of treatment in contra-distinction to the exhibition of aperients, and to he employment of enemata or glycerine suppositories. Holt was one of the first to point out that any undue increase in the percentage of fat was calculated to produce the symptoms of fat-dyspepsia—a condition which Finkelstein now describes as a fat-injury. These fat-injuries are quite distinctive, and exceedingly common among the infants of the well-to-do classes.

I always now treat cases of chronic constipation with a petroleum emulsion, which acts purely in a mechanical manner; it lubricates the bowel, softens the motions, cannot be absorbed, and never produces any injuries or symptoms. When combined with skilful massage of the colon, a free exhibition of this emulsion is the most successful line of treatment that I know of for this usually intractable condition.

I have occupied much time and space in describing a few of the common mistakes in infant feeding; I regret that I must leave untouched that great group of cases which are included under the terms "atrophy" and "wasting." These cases undoubtedly represent deferred food-injuries, for under appropriate lines of treatment they often completely recover and become, relatively speaking, strong and healthy individuals. I shall hope on some future occasion to deal with these lesions in a separate article.

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CIRCULATORY FAILURE IN THE ACUTE INFECTIONS OF CHILDREN. CAUSE AND TREATMENT.*

BY

JOHN HOWLAND, M. D., New York.

The subject of circulatory failure was first touched upon by the great clinicians of the early part of the last century. Fever was looked upon by all of them as the cause of the disturbance.

Stokes investigated with great care clinical symptoms and physical signs and came to the conclusion that the disturbance was due to cardiac weakness.

Laennec and Louis also studied symptoms and physical signs occurring during fever, and they also recognized the softness of the heart wall, its friability and brownish color after febrile death, but they did not connect the pathological findings with the circulatory failure. Stokes was the first to do this, and he wrote and taught that the symptoms of circulatory failure were to be referred to the *conditions* of the heart. Nevertheless, he admitted that in all the cases the clinical and pathologic evidence did not agree.

The discoveries made by Virchow, in regard to the parenchymatous inflammation of muscle with their confirmation and extension by other pathologists, apparently lent great support to Stokes' belief in the dependence of circulatory disturbance in febrile conditions upon anatomic injuries to the cardiac muscle. Hayem first found interstitial changes on the heart in typhoid fever and Birch-Hirschfeld and Leyden, independently of one

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*Abstract of Paper read before the New England Pediatric Society, Boston, March 26, 1910, *Boston Med. Surg. Journal.*

another, described interstitial changes in diptheria. Romberg studied typhoid, scarlet fever and diptheria hearts and showed that a certain number of days—roughly seven to ten—is necessary for the production of the interstitial changes which develop without reference to the early parenchymatous changes and continue after the infection is no longer apparent.

Naunyn carefully studied circulatory failure in fever from the clinical standpoint. He was impressed with the similarity of symptoms in febrile animals and those vessels had been paralyzed by a section of the spinal cord. He says that according to his ideas, arrived at from the observation of animals in febrile collapse, it is absolutely impossible to say that the collapse in febrile conditions is due to heart weakness. Direct evidences of this entirely fail. In the majority of cases the heart remains regular and the pulse may be palpable until shortly before death. The heart sounds remain clear to the very end. Nor can the increased frequency be looked upon as a sign of cardiac weakness, because with extensive disease, as in the late stages of diptheria, the heart may be slow.

Naunyn also regarded as especially important Quincke's observation that the arm veins in fever may pulsate, a phenomenon which indicated with the greatest certainty (when it is not due to tricuspid regurgitation) that a diminished tension of the vessel wall with a dialation of the capillaries and a lowering of the arterial pressure is present. Riegal came to the same conclusions as Naunyn.

Rosenbach, in 1881, wrote against heart weakness as a cause of death in infectious conditions in no uncertain terms. He said: "I believe that I have every ground for asserting that the belief that the heart is the earliest and most severely affected organ has nothing to sustain it. This belief has its practical expression in our fever therapy, and the results of it are the exaggerated stimulating and antipyretic treatment. Certainly of the organs necessary to sustain life that which shows the most important changes in its texture is to be regarded as the cause of death, but our methods are not fine enough rightly to judge of the grade of severity of the lesions in the separate organs.

Thus good clinicians have failed to accept the views that the heart is the cause of circulatory collapse. Opposed to them were those who believe the heart to be the sole cause. But there was still a third party.

It has been stated before that Stokes admitted that in certain instances no gross lesions could be found in the heart and later observers had the same experience. To explain this small proportion of fatal instances without apparent lesions, those believers in heart failure found it very easy after the advent of bacteriology and the introduction of the study of bacterial toxins to explain the circulatory failure on the basis of a functional interference with the cardiac muscle caused by the metabolic products of various bacteria. This hypothesis was also extended to those hearts with pathologic as well as without pathologic findings. Hesse was, I believe, the first one to suggest such a functional disturbance, and he did it in regard to diptheria; Griesinger followed suit in regard to typhoid and other diseases. Good clinicians, as for instance, Krehl, believe in a certain amount of this influence, and it will be seen later that vague though it is this view receives experimental support in tests with the product of certain bacteria.

Thus there are three classes. *First*, and by far the largest in number were those who believe in the anatomically diseased heart as responsible for circulatory failure; *second* those who believe in a functional disability due to toxins with or without anatomic change; and *third*, those who exonerated the heart entirely or chiefly and held to a paralysis of the vessels from central influences.

This is a convenient point to refer to in three pieces of work. Two of which were done more or less recently, since the deciding experiments of Romberg and Passler, and Passler and Rolly, which bear upon the view held by the first of these classes, viz., that the heart anatomically affected is responsible for death, and which had they been known at that time would have tended seriously to undermine this view. The first of these was the work of Krehl on hearts with fatty changes as the result of disease. Quantitative chemical examination showed such a slight increase in the fat content and that it could be hardly sufficient to affect seriously the cardiac activity. Krehl came to the conclusion that the fat content of the heart muscle bore no relationship to its capacity for work.

The second was the painstaking pathological study of Aschoff and Tawara. These investigators cut hundreds of sections from various parts of different hearts and decided that many of the changes frequently described as pathological were, in reality, artificial, and the third was the experiment of Hasenfeld and Fenevessy. Hasenfeld and Fenevessy studied the capacity for work of fatty, degenerated hearts. Phosphorus was used to bring about fatty changes and was given by mouth in doses sufficient to cause an enormous fatty transformation. Then, according to the methods of Romberg and Passler, hereafter to be described, tests were made of the capacity of the heart to work against greatly increased resistance. The startling fact was disclosed that a heart degenerated by phosphorus even to the most extreme degree was able to respond to tests almost as well as a normal heart. From such an experiment one obtains an idea of the enormous factor with which the heart is endowed.

They made their tests with reliance upon the following facts: By strong stroking of the abdomen from below upward a considerable quantity of blood is driven out of the abdominal vessels into the heart. At the same time the flow from the left heart into the abdominal aorta is impeded. The heart is filled to a greater extent, it drives the increased amount of blood into the aorta against an increased resistance, and the blood pressure rises. The increased pressure, however, only occurs when the heart is strong enough to satisfy the increased demands made upon it. If its capacity is diminished the increase in pressure is less as a result of abdominal massage is then the test of the hearts power.

Certain sensory irritations of the skin or mucous membranes, such as cold to the skin, or faradization of the nose, call forth a reflex excitement of the vasomotor centre in the medulla. A contraction follows in the vessles, chiefly of the splanchnic region, and the blood pressure rises. In order that an increase of pressure may take place in the sensory paths, the vasomotor center, and the vasomotor nerves must be capable of stimulation and action. But besides this a capable heart is necessary for the production of increased pressure, for a weak heart would be as unable to overcome the resistance afforded by arterial contraction as it would the overfilling caused by abdominal massage.

In a similar way asphyxia for about thirty seconds casues an increase in blood pressure by a stimulation of the medullary vasomotor center.

It would take too long to enumerate the various criticisms raised against experiments. They are not numerous or important save the one of von Stejskal. His criticisms were on purely technical grounds, but they impelled Passler and Rolly with new methods to repeat the experiments. Their results were much the same, absolutely so far as pneumococcus and pyocyaneus infections were concerned, but they found a marked diminution of the capacity of the diptheria heart to work against increased resistance or to withstand the effect of asphyxia.

These experiments, first of Romberg and Passler and then of Passler and Rolly, have been universally accepted as proving that paralysis of the vasomotor center is the chief cause of death in the circulatory collapse during acute infections due to these three organisms at least, and by analogy to many others.

Our knowledge in regard to other infections has been further increased by the experiments of Raczynski and Heineke. The former of these, Raczynski, investigated the influence of the streptococcus pyogenes upon animals, and his experiments were conducted exactly as were those of Romberg and Passler. He obtained results exactly as similar to those that had been obtained with the pneumococcus. The animals went into collapse and died with paralysis of the vasomotor center. The hearts were capable of responding to increased demands made upon them up to the end and the blood vessels contracted after injection of barium chlorid.

The comparison between the animal experiments and human patients has been made with adults. The similarity is as great with children. In them the circulatory failure comes on rapidly or slowly, but when fully developed causes pallor, cold extremities, rapid, soft pulse or its almost complete absence, with a heart whose sounds are usually clear, endeavoring by its over-activity to compensate for the emptiness of the arterial system. I have seen the heart of a child, who was pulseless beating so tumultuously as to shake the whole precordium. The heart, too, continues to beat after the anemia of the respiratory center has caused the respirations to become shallow and irregular, and finally to cease altogether. The evidences of true cardiac failure, such as intense cyanosis and venous engorgement and stasis with dilatation of the heart, especially the right ventricle, are only exceptionally met with in children; they are not the rule in fatal infections.

A knowledge of the pathological physiology is a *sine qua non* of intelligent treatment and we receive incalculable assistance from this source. The condition clinically is so severe and so frequently fatal that one is unable to judge accurately the effects of any given treatment, and thus it comes about that opinions as to the value of different drugs vary widely. We have three methods of choosing a drug. *First*, by its known effect upon healthy animals; *second*, upon its effect upon diseased animals, and *third*, by the results of clinical observations of diseased human beings during its use. Unfortunately these methods often do not agree, and two of them may be diametrically opposed to each other. Passler supplied the second of these methods, the effects of drugs upon diseased animals, by numerous experiments, which seem to point to a therapy more rational than could be indicated in any other way.

By experiments on healthy animals it is impossible to obtain any evidence that after intravenous injection alcohol is a cardiac or vasomotor stimulant. When given in large enough doses to produce any effect on the heart it casuses a lessened efficiency and a weakness of the contractions, and it also causes an inhibitory effect, and finally a paralysis of the vasomotor center, exactly what we wish to avoid. On animals with acute infections, before the stage of collapse, Passler found that alcohol in moderate quantities was without constant influence; it had no beneficial effect. Crile found that in shock, a condition much like that of circulatory collapse, alcohol in small doses had no effect, and in large doses increased the danger. The experience of practitioners that alcohol in septic processes is beneficial and can, to a certain extent, be utilized as a food, is entirely beside the question of circulatory collapse.

The use of ether as a stimulant in severe collapse is widespread. Many regard it as the strongest stimulant we possess, while others consider it practically useless. On healthy animals no favorable influence, either on the heart or vasomotor center, can be demonstrated. A favorable effect on the blood pressure was not observed, ether caused an immediate drop in pressure. The capacity of the heart itself to overcome increased resistance remained unchanged; the excitability of the vasomotor center was diminished. In a condition accompanied by a rapid fall of blood pressure one can only foresee danger from the exhibition of ether, and its use is absolutely contraindicated. The same may be said of the other drugs that dilate the blood vessels and lower blood pressure; nitroglycerin and the nitrites in quantities large enough to produce any results can only do harm.

With regard to strychnine, what we shou'd expect from experiments on healthy animals fails entirely to be realized on diseased anima's. Strychnine, according to Meyer and Denys, causes a rise in blood pressure by stimulation of the vasomotor center, but Passler found it without effect in circulatory collapse unless sufficient was given to cause convulsions, and Crile denies it any value in the treatment of the low blood pressure of shock. We can, therefore, not hope for much from strychnine; whatever beneficial effect it may have must be slight. It will, however, not act unfavorably.

Digitalis shows its chief effect in normal animals upon the heart and blood vessels and has only slight influence on the medullary center. According to Bohm and Gorz, digitalis induces a decided rise in blood pressure after section of the cervical cord; that is, when paraylsis is of the peripheral vessels has occurred. The heart, by acting more powerfully, can make up, for a time at least, for the injurious influence upon the blood pressure. From *a priori* reasoning, then, one would expect a beneficial effect only in the stage, when the heart is struggling by its over-exertions to compensate for the gradually widening vessels, and, indeed, Passler found such to be the case. The blood pressure rose, but the rise was only of short duration and in the most favorable cases lasted half an hour. Repeated injections had a lessened effect on none at all. Digitalis had no effect on the vasomotor center. For use on human beings in circulatory failure digitalis has the great disadvantage of slowness in action. It takes hours to manifest its effects after its exhibition by mouth, and we have no thoroughly reliable preparation for hypodermic use. If the failure is gradual in onset and we are far sighted enough to realize that the action of digitalis will be required in the not-too-immediate future, it may assist us, but for acute collapse digitalis by mouth is valueless. It is to be considered as an aid in reinforcing the action of other drugs, those that are theoretically indicated and practically of no value, the drugs that stimulate the vasomotor center.

Of the central vasomoter stimulants at present used in medicine, caffein is probably the best. The use of coffee in severe collapse has long been advocated, but its active principle has never received the appreciation in acute infections to which it is entitled. It has a marked prolonged and constant effect in contriving the vessels by central action, and it is readily soluble. Moreover it is a cardiac as well as a vasomotor stimulant. Passler considers the effect of caffein more certain and more prolonged and the remedy is much more readily administered than *camphor*, the other vasomotor stimulant commonly employed.

In addition to stimulating the vasomotor center by caffein and camphor, there is another method of raising blood pressure, namely, by increasing peripheral resistance and for this are chiefly employed infusion of salt solution and the injection of adrenalin. Infusion will act only so long as the increased amount of fluid is contained in the arteries and the blood pressure sinks when the abdominal veins still further dilate. Experimentally it is of value for only a short time.

The extraordinary influence of adrenalin on the heart and peripheral vessels is well known. It would seem a drug of great usefulness, and, indeed, undoubtedly is in such conditions as collapse from chloroform, surgical shock and in infections when the heart is entirely sound; but with diseased hearts, even those that respond favorably for long periods of time to other drugs, the use of adrenalin is attended with danger. Heinz found that with animals poisoned with diptheria toxin and with phosphorus, adrenalin caused a marked rise in blood pressure, but that the heart was so gravely affected by the increased demands made upon it that it eventually failed and the animals died before the control animals who received no adrenalin.

For many years there was no effort made to confirm the results of experiments on animals by observations on human beings. Last year, however, appeared a valuable piece of work by Sonnenkalb. He used a von Recklinghausen tonometer according to the method of v. d. Velden for estimating the functional activity of the circulation. He employed various drugs in health and disease and confirmed all of Passler's results in acute infections. Caffein was the most valuable drug; it worked certainly, promptly, and its effects were lasting (1-3 hours). Camphor was also exceedingly valuable and was prompt but somewhat uncertain, and its effect was evanescent and was over in less than two hours. Theobromin acted like caffein, but was less powerful and had less influence on the vessels. The nitrites and nitroglycerin had always a bad effect.

Dr. Hoobler and I made a series of observations on children in the wards of Bellevue on the effects of drugs on the blood pressure in pneumonia. We realize, of course, that blood pressure readings do not give complete information as to the condition of the circulation, but it is the only method clinically available. We used *caffein*, *camphor* and *adrenalin* intramuscularly. All three raised the pressure, adrenalin more promptly than the others, but its effect was evanescent, was over in less than half an hour, and in a few instances, the subsequent fall was to a point below where the pressure had been before its use. Caffein preparations were uncertain, but with a good one the best results were obtained. The increase in pressure began in five or ten minutes, reached its maximum in the neighborhood of half an hour, and was manifest for two hours or more. Camphor also worked satisfactorily, but was not quite so certain or prolonged as caffein.

That which raised the blood pressure more certainly, constantly and satisfactorily than any drug was cold air. We noticed that when patients were brought in from the balcony, where many are kept constantly day and night, their blood pressure fell progressively during the course of the next hour and then remained at a constant level, and indefinitely until they were put out into the cold air again, when the rise again occurred. The difference between the pressure indoors and out-of-doors was 10 to 15 mm. of mercury and the change always occurred. It was more marked the lower the pressure when indoors and the sicker children responded better. This cannot be the effect of more oxygen; it must be the reflex stimulation of the center due to the cold on the skin of the face and the nasal mucous membrane, and this view is further strengthened by the observation that cases of pneumonia treated out-of-doors do better in the cold months than in the warm. The importance of the cold air as a tonic to the vasomotor apparatus can hardly be overemphasized, and, as I said before, its effect is certain and constant and soothing.

We see, then, that critical clinical observation and animal experimentation are in accord in referring the cause of circulatory disturbance in acute infections to a failure and final collapse of the vasomotor center. There is also almost complete agreement obtained by animal experiments by modern methods of determining the human circulatory capacity as to the drugs and methods most useful in this circulatory disturbance.

The thing for us to do is so to live and so act the truth that a lie will not obtain. Lies do not hurt; it is the truth that hurts, and it behooves us to see that there are no weak spots in our lives where our names may be attacked truthfully.—*William C. Hunter.*

"The men who try to do something and fail are infinitely better than those who try to do nothing and succeed."—*The Caxton Magazine.*

"O powerful Goodness! bountiful Father! merciful Guide! Increase in me that wisdom which discovers my truest interest. Strengthen my resolutions to perform what that wisdom dictates. Accept my kind offices to thy other children as the only return in my power for thy continual favors to me." —*Benjamin Franklin's Prayer.*

Scene: A sick room: Master Jonny, a five year-old, propped up on pillows: Mamma and the doctor in the foreground.

Mamma (interlocutor)—"Now, Jonny, darling, here's some castor oil for you, fixed up with nice wine and sugar."

Doctor (beseechingly)—"Remember, mamma, don't let Johnny have it all; keep some for me."

Johnny (knowingly)—"Mamma, doctor's such a dear, good man, let him drink the whole of it, won't you?"

SOCIETY TRANSACTIONS*

New England Pediatric Society

The tenth meeting of the New England Pediatric Society was held March 26, 1910 at 8:15 P. M. in the Boston Medical Library.

Dr. John Howland of New York was the guest of the evening and read a paper on "Circulatory Failure in the Acute Infections of Children. Cause and Treatment."

Drs. Fred T. Murphy and James R. Torbert of Boston reported a case of "Cerebral Hemorrhage Relieved by Operation," in which the baby recovered from the operation and was discharged well to a convalescent hospital where it died sometime later of summer diarrhea. (There were no discussions on this paper.)

Dr. Dunn: (Dicussions on Dr. Howland's Paper).

I did not hear the very beginning of Dr. Howland's paper, but I was very much interested in listening to the remainder of it. I have thoroughly accepted the theory that the circulatory failure in these conditions is due to inflammatory or degenerative changes in the heart itself although that did not seem a very satisfactory explanation, particularly in connection with the results of the autopsies I have done at the Infants' Hospital, in which a great many children who had died apparently from circulatory failure in the course of acute infectious processes presented an absolutely normal condition of the heart muscles, valves, and everything else. I think that the explanation that Dr. Howland presents, with the evidence in its favor, is very much more satisfactory than the old idea that these circulatory failures are due to a condition located in the heart itself. Occasionally in the course of acute infections there are circulatory disturbances which prove to be due to the conditions in the heart itself, but it seems to me that these are easily recognized and differ very much from the form of circulatory failure which Dr. Howland has described. Most of the cases in which there are true cardiac lesions present actual symptoms of a cardiac incompetency, such as cardiac irregularity and murmurs, which differ in a marked degree from the symptoms described by Dr. Howland as due to vasomotor disturbance. I should think it is usually possible to distinguish the rare cases where circulatory failure is due to cardiac conditions from the commoner ones in which it is due to the vasomotor center conditions.

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* FRITZ B. TALBOT, Secretary.

Dr. Bowditch:

I was very much interested in listening to Dr. Howland's paper especially as it has dealt with a subject that I have been interested in and which I was asked to consider in discussing this paper, circulatory failure in diptheria. It seems to me that the two cases I am going to offer illustrate well what Dr. Howland has said and that despite the fact that toxine was given in small doses, that strychnia given to fight the succeeding cardiac disturbance and large amounts of brandy do not do much to aid the collapse. Whether fresh air at that time had any influence on these patients I cannot say. It is interesting to note that these two cases took place in July, 1903, when small doses of antitoxin were not infrequent. These patients incurred injections of 12,000 and one of 4,000 units, although septic and with a membranes extruding on both tonsils and soft palate. The apparent improvements of the pulse after the fall of temperature was only temporary, gallop rythm appeared in ten days to two weeks then disappeared and after a certain length of time of seemingly recovery both patients suddenly died, of heart failure. I will pass the two charts and hope that they will prove interesting. I should like to ask Dr. Howland whether oxygen was tried when children were taken into the wards as a possible factor in fresh air treatment; further, what he thinks about the cold air treatment of diptheria patients.

Dr. Ladd:

I should like to ask Dr. Howland if there is not a distinction between the acute circulatory failures occuring in the beginning of infectious diseases and those that appear late in convalescence, and if the causes of sudden death in the latter cases are the same as in acute circulatory failure occurring in the beginning of the disease. Are not some of these deaths due, not to a centr paralysis of the vasmotor apparatus, but to interstitial myocarditis? I have been particularly interested in what Dr. Howland has said as to the use of caffein, and I wonder how many of the physicians here carry subcutaneous preparations of caffein. The majority of physicians, I believe have depended chiefly upon strychnine, but after listening to Dr. Howland's paper we shall use more caffein than in the past. One of the most important things in the treatment of these cases of circulatory failure and one which is very difficult to obtain in children, I think, is absolute rest, and this is something which ought to be impressed upon us very strongly. I saw a striking case where from over exertion in the acute stage of infection, acute circulatory disturbance set in and the child died in a very few days. The child was a spoiled boy, absolutely intolerant of restraint, and after wearing out a nurse in two days, refused to take medicine from the second nurse. In order to have them bring the first one back, he resorted to an outburst of temper, suddenly sprang up in bed, yelled with anger and fell back, dying a few hours after. The difficulty of controlling the patients in their homes in these conditions, especially those who have never been restrained, is very great, and yet I fancy that this element of rest is most important of all in the treatment of these conditions.

Dr. Lucas:

There are two things I am very much interested in which I wish to speak of in this connection. One of them, which I wish to impress strongly on the profession, is the fact of over-stimulation. There are so many cases that come into the hospitals that we see, especially in children with pneumonia and other acute conditions, which we feel have been over stimulated. The fact of over stimulation I think is something that is even worse, from many points, than no stimulation at all. There are more cases, I think, in children who are over stimulated, given too much strychnia, or too much brandy, than those who are not given enough. I was very much interested in Dr. Howland's remarks about caffein. This is one of the drugs that I have been trying to use a good deal, and I have seen more results from it than any other one single drug in these acute infections, especially in pneumonia. That is the only really acute infectious disease in which I have been able to use it and note its effect not only hypodermically but by rectum. Given by injection is something we have not done to any extent, but hot coffee is something which is in use in every household and is one of those stimulants that anyone can resort to in these circulatory failures. I am very glad that Dr. Howland mentioned these two things.

Dr. Place:

I have enjoyed greatly the splendid and stimulating paper of Dr. Howland's, which has well proved the importance of vasomotor paralysis in these conditions.

In diptheria, however, I must say my experience does not bear out his remarks.

In this disease, circulatory failure is a most marked feature. It may occur as early as the first week. The variation in the type of symptoms would not favor the vasomotor paralysis as the sole cause. The circulatory disturbance may be of several types

(1.) Slow regular heart action often reaching 25 or 30 per minute. (2.) Gallop rythm with or without marked change in rate. (3.) Delirium cordis. (4.) Sudden death without distinct or even suspicious symptoms of circulatory disturbance.

Clinically, also, I have yet to find a case of diptheria at any stage of the disease with ciruclatory disturbance in which distinct changes in the character of the heart's sounds were not present. Dilatation is often not demonstrable, however.

Pathologically, also, in these cases muscular changes in the heart are present.

My experience in the use of drugs for this condition, is in practical accord with the speaker's. Alcohol, adrenalin, diagitalis, cocaine do not do good and apparently do harm. Strychnine shows no appreciable effect. Caffeine and camphor have given slight benefit.

Nothing however, has been of so much benefit in my opinion, as complete rest—horizontal position, interdiction of everything by mouth, rectal alimentation, and morphine in very small doses, subcutaneously. The first six cases in my experience of severe circulatory disturbance, with gallop rythm, pallor and persistent vomiting treated with this method, recovered and the mortality has been distinctly lowered in contrast with that of the "stimulated" cases.

The value of raising the blood pressure, throwing more work on the heart muscle, and causing heart wear, certainly may be questioned at times in these cases.

Cold air treatment has proved of value when the patient is very restless but artificial heat is almost always needed to keep up body temperature.

Dr. Howland, in Closing.

It will be better to answer the last question first. I believe the exact position of the vasomotor center is not known and there are no constant pathological findings in the nervous system. So far as I know none have ever been described. It is only by experimental methods that the involvement of the centre has been shown.

I spoke especially of the circulatory failure that occurred at the height of disease, in the first seven or ten days. The lesions then are parenchymatous ones; after seven to ten days there are in addition interstitial lesions. I would be the last to assert that patients with diptheria died late in the disease as the result of vasomotor paralysis. I think that then they almost always die of myocarditis. Where the influence of the vasomotor paralysis is shown in diptheria is at the height of the disease, in the so-called septic cases when death may take place on the fourth or fifth day. The cases of diptheria with late circulatory failure I especially avoided in this discussion. There is no doubt whatever that, as various experiments have shown, the cardiac muscle in diptheria is somewhat affected even if death takes place chiefly from vasomotor paralysis. The heart itself is affected after temporary asphyxia and it never regains its full power as it does in pneumococcus infections and streptococcus infections. This has always seemed to me one very urgent reason for performing intubation early in diptheria, this preventing a certain degree of asphyxia so that at the height of the disease the heart, in addition to the vasomotor center will not give out.

Dr. Ladd spoke of the cases in which the pulse ceased before the respiration. The pulse often ceases before the respiration but the heart does not cease to beat. There may be no pulse at the wrist but by auscultation the heart may be heard beating irregularly and tumultuously, to be sure, but often very powerfully endeavoring by its over-activity to fill up the empty arterial system. I think one can never tell that the circulation gives out before the respiration unless one auscultates the chest.

Dr. Lucas spoke of the overstimulation of patients. I believe that the majority of patients are over stimulated, and I think with wrong drugs. They are certainly stimulated altogether too much with alcohol. Dr. Lucas also spoke of caffein. A good preparation of caffein, I think is the best of the various stimulants. But I believe that many of the preparations of caffein that are used are almost or quite inert. I tried at Bellevue three preparations of caffein made particularly for the purpose, the citrated, the sodium benzoate and the sodium salicylate of caffein. From the first two we obtained very slight results, but we had prompt and positive and constant effect from the sodium salicylate. I think the other preparations were bad, and I am sure this is true of very many of the drugs which we use and which we rely on.

Dr. Bowditch spoke of the use of oxygen in the wards. I have not tried its effect on the blood pressure, but the wards where these readings were taken were as well ventilated as could well be so that we are inclined to the belief that it is the effect of the cold alone which increases the blood pressure by ten or fifteen mm. of mercury.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

EDITED BY

KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic, Mt. Sinai Hospital, New York City.

Subcutaneous Treatment of Hernia in Children. —A. G. Faulds of Glasgow, in the *Glasgow Medical Journal*, Dec., 1909, advises a simple closing of the inguinal ring by subcutaneous sutures, in such cases of hernia in which a radical operation would not be indicated. He gives three years experience with the simple operation and states that the results are equally as good as with the radical method. The operation is as follows: Anesthetic; child is placed on its back; skin sterilized. The hernia is first reduced; one sometimes two stitches are required; a strong curved needle, threaded with silk. The skin on top of the opening of ring, and with forefinger in canal needle is guided until it comes through the pillar of the ring. The needle is then sent over to the opposite pillar and taking a good hold, the needle emerges through the skin. The needle is then through the last exit and is brought through the subcutaneous fat in the long axis of the canal. The pillar of the canal is again pierced, and guided to the opposite pillar, taking a good hold again and brought through this subcutaneous fat and out through the original entrance. Thus there is made a purse string and when this is drawn tightly, the ring is closed, leaving sufficient room for the spermatic cord. By this procedure the skin and fascia below are puckered together and the ligatures are tried on the pillars of the ring. No trace of the operation can be found in a few days.

Some Important Factors in Infant Feeding. —T. S. Southworth (*Journal of Obstetrics*, Dec., 1909), declares the too hasty change from maternal to bottle feeding that is being resorted to at present, and lays down some axioms for breast feeding. The child's weight is an important indication of its progress. Crying is not a valuable indication that the child is not getting enough milk. Green or loose stools are often coincident with regular gain in weight. When the stools are scanty and the weight stationary, supplementary feeding is advisable, until breast milk improves. Sudden weaning is vicious and a good trial should be made before dropping breast feeding. Even with great disturbances a child should not be weaned until all factors have been thoroughly investigated. There is no imcompatibility between cow's milk and breast milk, and both may be given at once to the same child. Bottle feeding: Fat percentage is the important factor, and causes most disturbances. Colic is caused by too much fat. Begin with two to one fat. As strength of milk is increased, child should be fed at longer intervals. Regularity in feeding is of great import. Overfeeding is worse than underfeeding. Yellow stools are not always good stools. Malt soup is a good substitute for milk, but is to be utilized only for a short space of time. Sick children should have their food cut down considerably. Sick children should be fed differently than normal children.

Infantile Scurvy of the Hip Joint. —N. Jacobson, of Syracuse, calls attention to the fact that scurvy is more frequently overlooked than any other disease of childhood. (*Buffalo Med. Journal*, 1910.) It is mistaken for

Rheumatism, Potts disease, dentition, joint disease, nervousness, paralysis, nephritis etc. The epiphyses in children are particularly vulnerable and slight traunmatism may usher in a long standing but latent case of scurvy. The diagnosis is made by re-occurrences of hemorrhages from mucous membranes, periosteal hemorrhages, no elavation of temperature, reduction of amount of hemoglobin, absence of leucocytosis,etc., thus differentiating it from an acute infection. Infantile scurvy rarely occurs before the 6th month. The author attributes this disease to the use of patent foods, boiled milk may also cause the disease. He then details two interesting cases.

Congenital Word Blindness. —McCready of Pittsburg, in the *Virginia Med. Semi-Monthly*, Jan., 1910, states that word blindness occurs not at all rarely. The age at which it is first observed being from 6 to 23 years. There is a distinct hereditary influence in all these cases, and usually a neuropathic family history. The author believes that the speech and ocular defects are accidental stigmata of degeneration such as are found in mental defects. The pathology of this condition consists of a disorder of the visular memory produced by lesions affecting a definite area of the cerebral cortex, that is the visual centre. This corresponds to the angular gyrus alone or with the part of the supramarginal lobule. The word blindness occures as a result of defective development, either intracranial or as a result of injuries during labor. It may also occur after acute diseases. Symptoms: about one-half are also letter blind, while some cannot recognize figures. Some can do arithmetic. There are various gradations in symptomatology.

Diagnosis. Given a child of school age, intelligent, who has difficulty in learning to read, and who mistakes words, who has normal vision—this child is word blind. The author then cites an interesting case, and concludes by stating that with systematic individual training, it is possible to cure this disease.

Persistent Periodical Vomiting of Infants.—This form of vomiting has been described as attacks of incoercible vomiting lasting from one to several days and recurring periodically, was described in 1882 by Leyden, but was not recognized in France until it had been spoken of by other American authors. It is due to the observations of Comby that this persistent vomiting has been in the great part understood, since this author showed the principle characteristics of the affection, discussed its pathology and brought forward a hundred observations relating to this syndrome.

The age at which these accidents begin is very variable. Under one year it is a rare affection, and a greater frequence belongs to the second period of childhood, (eighteen months to two years). The author brings forward its connection with arthritism and uricacidemia, and especially with migraine. This periodical vomiting is often seen in the same family; brothers and sisters simultaneously or successively being attacked by this phenomena. With regard to the antecedants, it is found that children suffering from periodic vomiting are usually of a nervous type and have digestive trouble. In fifty per cent. of the cases, appendicitis has been recognized as the direct cause. This new etiology should be taken into consideration since it is opposed to the theory of Marfan who considered acetoneuria as being characteristic and the cause of periodic vomiting. Comby, on the contrary, thinks that acetoneuria is of great frequence in the acute stages, but cannot be considered diagnostic or prognostic. Acetoneuria is not a serious trouble and it is observed in many pathological conditions. It cannot, therefore, be the determining cause of periodical vomiting of children.

The attacks of vomiting begin suddenly when the health is otherwise good. In some cases prodromes have been observed such as diminution of the appetite, strong odor, a fetid or stale breath, white tongue and vague pains in the stomach, urticaria, etc. The vomiting appears without any warning, at any hour. The vomit is first made up of alimentary substances, then becomes acqueous, mucous and biliary with a green color, is usually painful and takes place with some effort, when it becomes incoercible, following immediately on any attempt to give nourishment. Water itself is not even tolerated, but is immediately projected. It is, therefore, necessary to abstain from the ingestion of any liquid or solid during the attack although the patient suffers much from thirst. The acetoneuria with the characteristic odor of the breath and the special reaction of the urine is not constant, but is found in about 25% of cases. Duration of the attack of vomiting is very variable and usually lasts two, three or four days. However short the attack may be, it produces considerable emaciation, the facies are drawn, the eyes cave in and have black circles around them, the nose becomes pinched, and in spite of this alarming condition, which suggests a terminal stage, the child soon recovers its health at the end of an attack.

Comby insists on obstinate constipation which usually proceeds, accompanies and follows the attack as in appendicitis. It is often noticed the coincidence of a mucous membraneous enterocolitis, dilatation of the stomach and adenoids. The absence of fever during the attack is somewhat frequent, the mean temperature does not exceed 38 to 38.5 degrees C. Secondary symptoms are the diminshed amount of urine excreted showing deposits rich in uric acid, and there are such nervous symptoms as headache, delirium, agitation, which may become so accentuated in some cases as to suggest meningitis.

The attacks of vomiting have a tendency to return. These are known as vomiting relapses, but there does not seem to be any rule or any definite prevision. Sometimes it is once or twice a month, sometimes every six or eight months.

The tendency to spontaneous cure makes us consider the prognosis favorable in a great number of cases. Nevertheless, some fatalities have been observed and the author has had three infants die during an attack.

In certain cases the periodic vomiting can be referred to a chronic form of appendicitis and the prognosis may be confounded with it. The diagnosis is extremely difficult when the first attack takes place. It is generally thought to be a simple indigestion or an accidental poisoning coincident with migraine. We must more especially recognize the possibility of acute or chronic appendicitis and proceed to a methodical examination of the abdomen more especially at MacBurney's point.

The treatment during the attack is complete rest in bed, absolute diet. The infant can be nourished with nutritive enema, or injections of artificial serum; after twenty-four to forty-eight hours of absolute diet, or simple aqueous diet, alimentation can be renewed with bouillon of legumes, decoctions of rice or barley, etc. During the interval of attacks a vegetarian regimen is recommended, preferably dried and green legumes, infants' food, cooked salad, cooked fruit, and water; fresh air, hydrotherapy and cutaneous friction. The author recommends the use of bicarbonate of soda in large doses twenty days of each month, but when the periodical vomiting has any relation to a chronic appendicitis, the only efficacious remedy is the removal of the appendix.

J. Comby, *Archives de Medecine des Enfants*, Octobre, 1909.

A Treatment of Nevi.—Flexible collodium, 30 grammes, corrosive sublimate, 2 grammes. This mixture is painted on the nevus with a fine camels hair brush and allowed to dry, thus forming a fine layer. This is repeated a number of times so as to form a pellicle. Evaporation may be hastened by fanning. The painted nevus is dressed with sterile cotton. At the end of two days the above pellicle is removed and the entire process repeated. On the sixth day a brown scab or crust forms. When this is detached a small ulceration or eschar is found. This is dressed surgically and allowed to cicatrize. Sometimes it is necessary to make four or five applications of the sublimated collodium.—*Le journal des Medicine et de Chirurgie.* Montreal, Canada, March 26, 1910.

(Though this process is attended with success, we now have a better method for the removal of nevi, in the application of the solid carbon dioxide.) E. W. D.

The Contagiousness of Vaccinia.—The observations of Gerowne (Berliner Klinische Wochenschrifs 1-4, 1910) as reported by G. Loeser in *Le Progres Medical,* Feb. 26, 1910, are of importance to the pediatrist.

The transmission of the vaccine virus by contact is much more frequent, than we generally assume.

General vaccinia from auto-inocualtion, as well as from accidental infection of the eyelids and conjunctiva, followed by deep parenchymatous Keratitis, are of rather common occurrences.

He also cites 20 cases of children, who were suffering with eczema and who consequently were inoculated with the virus. These children had not been vaccinated, but they took vaccinia from other brothers, they presented a generalized eruption of the most severe type. Six of them died. In one of them the disease resembled confluent variola, accompanied by multiple adenopathy and by swelling of the liver and the spleen. Gerowne attributes the seventh of these cases to the facts that, 1, the human lymph acts more virulent in human beings than cow's lymph, 2, that the quantity of the inoculated lymph is greater and 3, that the erosion in the skin of these eczematous children favor the entrance of the poison into the circulation.

He concluded that nobody coming in contact with eczematous children should be vaccinated.

(If such has been the case, however, the points of inoculation should be carefully guarded by occlusive dressings.

Such procedure should be made obligatory and greater care should be taken to protect the public against the danger of such an infection.) E. W. D.

Dried Milk as a Food for Infants.—C. K. Millard (*Brit. Med. Jour.,* 1910, i, 253) describes the preparation and use of dried milk and the results obtained from its use as an infants' food. Dried milk is prepared by feeding fresh milk in a continuous stream on to revolving cylinders heated by steam to about 250 degrees F., the moisture in the milk being instantly dispelled. A thin film of dry milk forms on the cylinder and is detached by knife-edges. It is subsequently passed through a sieve and is obtained as a coarse, granular, cream-colored powder practically sterile, which, in air-tight packages, will keep almost indefinitely. The relative proportions of the main constituents —proteids, fats, milk sugar, and salts— remain practically unchanged, but changes occur in the more complex albuminoids and enzymes, similar to those in boiled milk. The extremely short time during which the milk is subjected to the heat by the Just-Hatmaker process described above, may cause less change than occurs in boiling. When mixed with water about 60 per cent. of the dried milk is soluble, the remainder is readily suspended. This dried milk has been used at an Infants' Milk Depot for eighteen months, for about two hundred infants. One advantage discovered was greater digestibility; many infants with whom liquid milk did not agree, thriving on the dried form, and retained it. This difference is accounted for by the character of the curd formed in the stomach which does not tend to form hard cheese-like masses. All infants not thriving on bottled milk were placed on the dried milk, with excellent results. After a period of ten months or longer careful records and investigations showed no scurvy or rickets resulting from its use and no bad after-effects have been discovered. The advantages of the dried milk appear to be: *Ease of digestion*, *bacterial purity*—freedom from tubercle bacilli and contamination by flies. *Conservatility*—no "souring" in hot weather. *Convenience*—a definite quantity being mixed with warm boiled water. *Cheapness.* The presumed destruction of the antiscorbutic properties of the milk is theoretical, but can be compensated for, if thought necessary, by administering fruit juice, Dried milk, being after all "only milk," is in an entirely different category from all patent foods prepared from cereals, and is superior to them.

The Dwarf Tapeworm, an Intestinal Parasite in Children.—Oscar M. Schloss (*Archiv. Pediat.*, 1910, xxvii) reports 14 cases of dwarf tapeworm or Hymenolepis nana, in 230 children. The average length of the worm is from 14 to 16 mm. The distal half is broad, while the proximal half becomes narrow. The segments are from three to six times as broad as long and the head of the worm is globular and carries four suckers and a rostellum armed with twenty or thirty bifid hooklets. Its habitat in man is in the upper two-thirds of the ilium. The eggs are slightly oval and have two membranes widely spaced. From the poles of the inner membrane are projections from which spring filaments which ramify in the space between the membranes. This is characteristic. The 230 children examined were from the tenement-house district, and, with one exception, were all born in New York City. Six of the 14 cases observed showed no symptoms referable to the parasite. The remaining eight cases showed gastro-intestinal and nervous symptoms. Under the former, epigastric pain, nausea, vomiting, and an increased appetite were prominent. Restlessness at night, grinding the teeth, itching of the nose, and genital pruritus under the latter. Eosinophilia was present in seven of the eight cases suffering from symptoms of the parasite. In cases with no symptoms eosinophilia was uniformly absent. A secondary anemia was generally present. The absence of, and variety in, symptoms are probably due to the site of mechanical irritation in the intestine and to toxic effects. The mode of infection is through ingestion of the ova in food. No intermediate host has been found in any human food. The dwarf tapeworm, however, has frequently been found in the small intestine of rats. Auto-infection is possible, owing to the great number of ova in the feces. The diagnosis is made by finding the characteristic ova in the feces or by obtaining the parasite after treatment. The treatment consists of a preliminary period of two or three days on liquid diet, a preliminary purge, and the administration of oleoresin of male fern in mixture, emulsion, or capsule. The dose for a child two to four years old is 0.5 dram; four to six years 40 grains; and six to twelve years, one dram. This is given on an empty stomach. It is divided into three or five doses and given at half-hour intervals. A brisk cathartic is given a half an hour after the last dose is taken. When the treatment is not effective the ova reappear in the feces in fifteen days.

Vomiting in Infants.—This symptom is more often the deferred result of some initial mistake in feeding than due to the method of feeding which is in force for the time being. The habit of vomiting is very easily acquired; it becomes, in fact, an automatic reflex so sensitive and insistent that food is rejected no matter what be its nature. Infants who have acquired this habit from injudicious methods of feeding during the time that the nerve-centers concerned are exceedingly plastic and impressionable are unavailingly treated by changes in the diet or by full doses of bismuth and soda. The only scientific method of treatment is to attempt to break the automatic nature of the habit by temporarily exhausting the center or by dulling its sensibility to stimuli which reach it through the stomach. For dulling the center, such drugs as chloral, bromide, or chloretone are distinctly useful. As soon as the habit is broken the remedy may be suspended. The author has lately tried a method of exhausting the center, with encouraging results. He gives a harmless emetic, such as vinum ipecacuanhae and carbonate of ammonium, about half an hour before feeding. After the violent stimulus of the emetic the stomach fails to respond by vomiting to the milder stimulus of food. He has employed the method in fifty-five cases; in thirty the cure was immediate and permanent, in ten the symptom was ameliorated, in five there was no improvement. In using this method it is of course essential that other causes of vomiting, apart from habit, be excluded. E. Pritchard (*Clinical Journal*, February 2, 1910).

A Practical Method of Anesthesia for the Removal of Enlarged Tonsils and Adenoids, and for Other Operations on the Head.—M. Ernest Jutte of New York advocates a simple method of continuous anesthesia which does not interfere with the surgeon's work. A wide-mouthed bottle with a double perforated rubber stopper, which holds two tubes, is used. One tube reaches the bottom of the bottle, the other just passing through the stopper. The long tube is connected with a double bulb, the short one with a metal mouthpiece such as is used by dentists. Narcosis is induced by the drop method, until the patient is well under. The metal mouthpiece is hooked around the mouth gag and ether vapor forced into the mouth of the patient by the rubber bulb. Narcosis can be kept up for a long time.—*Medical Record*, May 7, 1910.

Some Newer Conceptions of Myocardial Disease.—Thomas E. Satterthwaite of New York classifies myocardial affections into acute parenchymatous, acute diffuse, and chronic myocarditis, fat heart, fatty degeneration, hypertrophies, and atrophies. Parenchymatous changes are the precursors of inflammatory conditions, and may be considered early symptoms of them, the diffuse form following them. Myocardial disease is comparatively frequent; the author's records show that 45 per cent. of deaths from heart disease have been mainly caused by degenerative changes in the heart. Parenchymatous alternation is the first found. Diphtheria and other toxemias cause many cases of this variety of degeneration. Acute myocarditis is a diffuse inflammation in which all the elements of the heart are inflamed; it may be localized or not and may go on to suppuration. Cardiac hypertrophy may be caused by exercise, arteriosclerosis, congenitally small vessels, scoliosis, Graves' disease, and is seen in the neurotic heart of hysteria. Fat and fatty heart are not synonymous, fatty heart being a true degeneration and fat heart an infiltration of fat between the muscular bundles. Fat heart will not interfere with the functions of the muscle. Fat heart is rare in advanced life, when degeneration is frequent. Fatty degeneration is found in wasting diseases, prolonged fevers, mechanical injuries, after surgical operations in cardiac hypertrophy, endo and pericardial diseases, etc. It is precipitated by overexcitement and exertion, abuse of eating and drinking, etc. The signs of degeneration are not very marked; dilatation is the principal one, and that may be absent. Atrophy of the heart is rare. Hypertrophy shows three stages: irregularity, compensation, and dilatation. It indicates the existence of some serious primary affection. The author goes over the diagnosis of the different forms of myocardial disease and their treatment.—*Medical Record*, May 14, 1910.

The Preservation of the Teeth of School Children.—Rules recommended by the School Children's Committee of the British Dental Association and circulated for the information of managers and teachers of the national schools in Ireland:

Without good teeth there cannot be good mastication.

Without thorough mastication there cannot be perfect digestion, and poor health results.

Hence the paramount importance of sound teeth.

Clean teeth do not decay.

The importance of a sound first set of teeth is as great to the child as a sound second set is to the adult.

Children should be taught to use the tooth brush early.

Food left on the teeth ferments, and the acid formed produces decay.

Decay leads in time to pain and the total destruction of the tooth.

The substance of the following rules should therefore be impressed constantly upon all children:

1. The teeth should be cleansed at least once daily.
2. The best time to clean the teeth is after the last meal.
3. A small tooth brush, with stiff bristles, should be used, brushing up and down and across, and inside and outside, and in between the teeth.
4. A simple tooth powder or a little soap and some precipitated chalk taken up on the brush may be used if the teeth are dirty or stained.
5. It is a good practice to rinse the mouth out after every meal.
6. All rough usage of the teeth, such as cracking nuts, biting thread, etc., should be avoided, but the proper use of the teeth in chewing is good for them.

When decay occurs it should be attended to long before any pain results. It is stopping of a small cavity that is of the greatest service.

In 10,000 children's mouths examined 86 of every 100 required skilled operative treatment.

The Vaccination Creed.—After many years of experience with smallpox and vaccination, the Chicago Department of Health hereby declares:

First. That true vaccination—repeated until it no longer "takes"—ALWAYS prevents smallpox. NOTHING ELSE DOES.

Second. That true vaccination—that is, vaccination properly done on a CLEAN arm with PURE, potent lymph and kept perfectly CLEAN and UNBROKEN afterwards until the scab falls off naturally—never did and NEVER WILL make a serious sore.

Third. That such a vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life, and is the ONLY conclusive evidence of a successful vaccination.

Fourth. That no untoward results ever follow such vaccination. On the other hand, thousand of lives are annually sacrificed through the neglect of vaccination—a neglect begotten of LACK OF KNOWLEDGE.

The creed and a supplement giving full information of the proper method of vaccination and other data was printed in circular form and distributed widely. The smallpox subsided promptly and vaccination was given such a boost that smallpox will not again, for a generation, be a menace.

In our smallpox hospital we took classes of students from the various medical schools and taught them to diagnose the disease and to treat it. None of them contracted the disease, and none of them carried it to others.

Gonorrhea in Children.—The statistics of the Vanderbilt Clinic, New York during the past three years are analyzed by B. W. Hamilton, of New York, who notes a surprising increase in the number of cases of vaginal gonococcus infection revealed by a more careful scrutiny of little children coming to the clinic as out-patients. Their treatment has become a problem of much importance.

He describes the methods of examining the children. In 40 cases in which the upper portion of the vagina was tested, gonococci were found in every one. Of the 344 cases observed, the average age was 5.1 years. Ophthalmia from autoinfection was rare, occurring in only four cases. Arthritis was observed in three, but there were probably more cases that could not be traced. Nocturnal enuresis, not pre-existing, was present in 10 cases. Inguinal adenitis was very rare and observed only twice. There were no cases of cystitis or urethritis observed, nor a single instance of pelvic or general peritonitis, though such cases have been observed by others.

Two methods of treatment were employed—irrigations and vaccines—and methods are described. In the vaccine treatment the opsonic index is not taken, except in a few early cases, as there seems to be little relation between the index and the vaginal discharge. Three separate vaccines were used: one prepared by Dr. R. B. Lamar, of the Rockefeller Institute for Medical Research; another from a stock culture at the Presbyterian Hospital, both of these having a strength of 100,000,000 to one Cc.; and stock vaccines prepared by Parke, Davis & Co., of strengths respectively, of 50,000,000, 100, 000,000, and 500,000,000 per Cc. In the majority of cases, regardless of age (except under six months) the treatment was started by an injection of 50,000,000 every fifth day, increasing the dose by 10,000,000 until five injections had been given, when the interval was made 10 days. In most of the acute cases six injections sufficed for a cure. In those of long standing, further injections, brngng the dosage up to 200,000,000, were required. Care was taken to insure the completeness of the cure.

The conclusions are summed up as follows: "Vaccine therapy has a place in the treatment of this infection in little children for the following reasons: 1. The short time required for a cure in over 85 per cent. of cases. 2. The ease of administration of the vaccine; no special apparatus or knowledge of technique being necessary. 3. The vaccine is apparently harmless when used under aseptic precautions. 4. It is not necessary to take the opsonic index, with its complicated technique. 5. It eliminates irrigations, which direct the child's attention to its genitals, at times encouraging precocious masturbation. The frequent douches necessary in the irrigation treatment will with the best care and gentleness, produce some injury when continued over a long period of time."—*Jour. A. M. A.*, April 9, 1910.

The Limitation of the Caloric Method of Infant Feeding.—Henty Dwight Chapin of New York states that caloric feeding of infants is a failure, on account of the absence of any index of the amounts of protein needed for the infant's growth. If only as much heat-producing material is taken in as there is heat given off, there can be no storage of protein for growth. The amount of food needed for growth cannot be determined by the amount of heat excreted. Foods that are of equal heat-producing value, and equally digestible are not interchangeable for different individuals.—*Medical Record*, May 28, 1910.

Diphtheria Bacillus Carriers in the Public Schools.—By Drs. Slack Wade and Blanchard (*Journal A. M. A.* March 19, 1910.) After a study of the school children in the Brighton district numbering about 4,500, the following conclusions were reached:

1. At least 1 per cent. of all healthy school children are carriers of morphologically typical diphtheria bacilli (Wesbrook's A. C. and D. types).
2. Such bacilli are communicable from one person to another, and the condition is usually a transient one.
3. The organisms are ordinarily of little or no virulence.
4. While it is possible that by passing through a susceptible individual their virulence might be raised to cause the disease, this is not a frequent occurrence.
5. The disease diphtheria is kept alive in a community rather by virulent organisms in immune persons than by these non-virulent bacilli.
6. Where virulent diphtheria bacilli are present, as shown by outbreaks of the disease, cultural tests of all contacts and isolation of those showing positive cultures is a duty owed to the community.
7. Where the disease does not exist, isolation of carriers of probable non-virulent bacilli is of no proven benefit, and is a costly and laborious procedure entailing much unnecessary hardship on innocent and probably harmless parties.
8. The attempt to control diphtheria in a city by a round of cultures from all school children at the beginning of the school year does not seem encouraging from this series of tests.
9. The proposition to stamp diphtheria out of a city by cultural tests of all the inhabitants and isolation of all carriers is impossible from any practical standpoint.

Prophylaxis of Scarlet Fever and Measles.—Apply a weak solution of oil of eucalyptus to the surface of the patient's body, until the fifth day, as often as each hour; later, once or twice a day will be sufficient. This solution should not be stronger than 10 per cent., but may be 3 per cent. or 5 per cent. For measels the same treatment is as efficacious in preventing the spread of the ailment, continues the *Spanish Revista de Sanidad Civil*, July 30, 1909. Milne, of London, advises this method, and suggests a mild phenol lotion for the nose and fauces, from which additional danger may be met.

We think that in certain patients, very sensitive in the skin tissues, the oil of eucalyptus might excite idiosyncratic reactions, and the use of phenol, in sufficient strength to disinfect the nasal and oral cavities, might be toxic. Nevertheless, such reactions are not common. The need of restricting the spread of so baneful a disease as scarlet fever requires no argument. People say, How is it, in the heart of virgin country, as in the back woods of Australia, or on the plains of the West, in our own country, children develop measles? In what mode does the case orginate? Can we trace it by letters, or packages? Undobted cases of the transmission of scarlet fever by clothing long put away in trunks, or boxed up, are on record. The value of the oil of eucalyptus, if it can be depended on, is chiefly in the destruction of the pathologic excreta at once. Bed-clothing can then be immersed in boiling water, when removed

The Latest from Von Pirquet.—Speaking before the Philadelphia Pediatric Society a few weeks ago on the latest development of his cutaneous tuberculin test, Von Pirquet made some interesting and practical observations. There are new and authentic records of 328 cases of children previously subjected to this test. Of these 124 gave a positive reaction and examination showed tuberculosis in 123 of these 124 cases. In general the reaction is very intense if the infection has just started or has recently made progress. Further than this, a positive reaction does not go in giving as information as to the amount of damage done. One small gland may be infected or a whole lung may be breaking down.

The negative reaction is less conclusive. As in typhoid and the Wasserman test for syphilis, antibodies may not be present in large enough quantity to give the reaction. It is more often lacking than in emaciated patients, in the later stages of miliary tuberculosis and tuberculosis meningitis. Curiously enough the reaction is always lacking during the first week of measles.

In adults the reaction is only occasionally useful, since so many with an old healed tuberculosis give a positive result. In cases of doubtful physical signs, however, an intense positive reaction certainly indicates a tuberculous infection.

In children, Von Pirquet says the reaction is useful in the diagnosis of the following conditions: chronic intestinal marasmus, bone lesions, emaciation, anemia, subacute bronchitis, glandular swelling, furunculosis and other skin lesions, beginning meningitis. In many of the cases it is not only diagnostic but prophylactic and therapeutic.

Finally he told of a very practical use of the test which he had been able to carry out in Baltimore. The 227 children of an orphan asylum were all subjected to the test. Of these 25 below the age of six gave positive reactions. These were promptly separated from the healthy children and in this manner the inmates are protected from possible infection by their playmates. It seems that this simple procedure might have a wide application among institutions having the charge of small children.

BOOK REVIEW

Diseases of Infancy and Childhood. Their Dietetic, Hygienic, and Medicinal Treatment. A Text-book designed for Practitioners and Students in Medicine. By Louis Fischer, M. D., Attending Physician to the Willard Parker and Riverside Hospitals of New York City; Attending Pediatrist to the Sydenham Hospital. Former Instructor in Diseases of Children at the New York Post-Graduate Medical School and Hospital, etc., etc. Fellow of the New York Academy of Medicine. With 303 illustrations, several in colors, and 29 full page half-tone and color plates, 979 Royal Octavo pages, extra cloth $6.50 net. Half Mor. $8.00. F. A. Davis Co. Publishers, 1914-16 Cherry St., Philadelphia, Pa. Sold by subscription only.

The demand of the profession for the third edition of this most excellent work bespeaks its popularity, and reflects the esteem with which its author is held as a teacher of "Diseases of Infancy and Childhood". So comprehensive a work in such a condensed form has rarely been introduced to the profession. The present revision mirrors a thorough and complete resume of the whole subject of diseases of children and is the most complete exposition of the world's best and latest knowledge in Pediatrics. This new edition —might properly be called a new book— so extensive have been the changes, that scarcely a chapter has not been remodeled or re-written.

In this revision, a chapter on Tyndillization has been omitted. The articles on Pasteurization and Sterilization have been changed so as to conform to modern bacteriological views. Sterilized milk is condemned and milk steamed to a temperature of 140 degrees is advocated beacuse the tubercle bacillus and most pathogenic bacteria are destroyed at such temperature. The author aims to feed the infant milk with its unaltered albumen and casein, and believes that chemical changes of the milk induced by prolonged heating is one of the important factors in the causation of rachitic children. Complicated methods and especially percentage methods of feeding, while described in detail are not recommended as a *sine qua non*. The author aims at maternal feeding and pleads for human milk either in the form of maternal or wet nurse, as a means of conferring immunity to the infant. A new method for the collection and preservation of human milk from various mothers is described. A chapter on the caloric method of feeding much in vogue in Germany and advocated by Heubner has been added.

A new article on lordotic albuminuria has been added, so have articles on scabies, indicanuria, pyuria, acetonuria, and diabetes, been substituted where very lengthy articles were condensed. In spite of the numerous new articles and very many illustrations that have been added, the book itself has not been increased in page numbers.

Some of the most important therapeutic points include the re-written chapter on cerebro-spinal meningitis, and a new article giving the intraspinal; also the intraventricular methods of treatment with Flexner's anti-meningitis serum has been added.

In septic diptheria the intravenous injection of antitoxine has been added. In post-operative hemorrhage and in hemorrhage following operations in cases of hemophilia, the injection of horse serum is described.

New points in the diagnosis of scarlet fever are described. Many new plates and illustrations, such as the Von Pirquet tuberculine reaction in scrofulosis and tuberculosis is shown. Illustrations of encephalocele, and such rare conditions as omphalocele have been added. An excellent illustration showing the spores and threads of sprue are given. The technique of the intraventricular injection in meningitis has also been added.

The above are a few of the important points which have been added for the teacher in the college, for the student requiring up to date data, and most especially for the general practitioner who requires the latest ideas and details in therapeutics.

The author is more than a well known Pediatrician. He shows his capacity as a teacher in the way in which he handles his subject, and his ability as a clinician in the thorough manner in which he brings out the various phases of the symptomotology and diagnosis of diseases of children and in the attention which he gives to treatment.

To Doctor Fischer, the profession is under many lasting obligations, and to the publishers, who appreciate a good work we commend for their business tact and rare sagacity for placing this work before the profession in a style worthy of its contents.

This is a book for the desk and not for the shelf . We have never examined a work of "Diseases of Infancy and Childhood" with which we were more pleased, and to commend this volume is both a pleasure and a duty.

PEDIATRICS

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EDITORIAL

PARATYPHOID INFECTIONS.

No Clinician who has seen many cases of typhoid-like infections and who has conscientiously and repeatedly tested their blood for the Widal reaction, has failed to encounter a number where this test was persistently negative even during the convalescence and where the clinical picture yet did not admit of any other diagnosis. Since Libman has shown the absolute specific character of the Widal reaction if done properly, a positive result admits of no false diagnosis in doubtful febrile conditions provided previous typhoid can be excluded; but the question, whether inversely all typhoids must yield Widal's has, in the light of the so-called paratyphoids, long been an open one. For a purely theoretical reason they have been classed as a separate infection, until with the rapid advance of bacteriology, a scientific foundation has been created for this. More, it was found that the germs responsible differed in certain respects from the Eberth and the colon bacillus. Different authors soon published reports which showed that we are not dealing with one but with a group of intermediates which are, however, so closely allied that our present technic has hitherto been inadequate to properly define and classify them.

Some years ago, B. H. Buxton (*Jour. of Med. Research*, June, 1902), undertook the difficult and almost hopeless task of bringing some order into this class; his experiments were conducted with nineteen different cultures obtained from this country and from Germany and included growths of bacilli such as that of Gartner and the dysentery and hog cholera germs, which while they do not strictly belong to the parocolon group, are still closely related to it in that their site by preference is the intestinal canal and the symptoms to a marked degree enteric. No difficulty was experienced in distinguishing the intermediates as a group, from the bacillus coli communis on the one hand and the typhoid on the other; when, however. the intermediates are more closely studied, it was found that the difference in growth on the ordinary media, such as agar, serum, gelatine and bouillon were only those of degree. Potato also proved to be an uncertain medium to deal with; the indol test was unreliable at its best; the French method of growing on scraped-off cultures offered little encouragement in differentiating and even on Hiss' semi-solid media no constant difference between the intermediates themselves could be detected. Experiments on pathogenicity were not attempted as offering not sufficient hopes for success. Better results were obtained with milk, which is not coagulated by any of the intermediates, but some of them are found to produce, after initial acidity, sufficient alkali to render the milk opalescent. The degree of opalescence varied so that two groups could be formed: group one of paracolons giving irregular symptoms, symptoms of meat-poisoning or typhoidal symptoms and including the germ of hog cholera, where after 20 days there was distinct opalescence; and group two or paratyphoids with solely typhoidal manifestations, where the milk was opaque after the same length of time. A simple method of distinguishing the intermediates from the typhoid germs is the gas-production which goes on with the former with most of the sugars except lactose, while individual differences are found with the different members. By the use of a glucose agar medium containing neutral red very striking effects were obtained, since the colon bacillus changes the color more rapidly to yellow than the intermediate. It is probably the most valuable medium we have at present for determining between group one and two, for with the former there is still a band of red at the surface in 24 hours while with the latter no change is noticed before 48 hours. It is of interest to note that the grouping is the same with the colored media tests as it s with milk, Finally a number of experiments were made on agglutination. By immunizing rabbits to the various organisms by subcutaneous injections of living agar cultures and then testing the blood, members of the paratyphoid group were found to interact freely; quite as readily in fact as various strands of typhoids would be likely to do and it appears that we are here dealing with a distinct species, the members of which are indistinguishable from each other. Conditions are not, however, so simple with the paracolons; thus the bacilli causing epidemics of meat-poisoning do not form a distinct species, but are simply members of the group since there are differences in their agglutination. Those, however, which give typhoidal symptoms showed mutual reactions and hence it is better to group them among the paratyphoids, although according to their cultural properties they belong to the paracolons.

APPENDICITIS IN THE YOUNG.

We have the pleasure of presenting to our readers in this issue a paper entitled "Appendicitis in Children," read by Dr. Isaac Wood before the 43rd annual meeting of the Canadian Medical Association, held in Tronto, Canada, on June 1st. We are advised that this paper created a good deal of interest and discussion before the meeting. Appendicitis in the adult has become more than a twice-told tale, but with the young and particularly in infancy we are greatly in the dark and much in need of all the help that observation and experience can throw on the subject.

Stomach ache in boys is not an uncommon affection. Their surreptitious diet is often very different from that which their care-taking parents are wont to believe is their sole sustenance. Yet any stomach ache is open to suspicion. It may be but the clamor of an outraged digestion or it may be an appendicitis, and yet if every case of stomach ache were diagnosed as appendicitis most of our schools for boys would be half empty during most of the year.

To err on the other side is also to invite death, as some of the selfsame stomach aches are forerunners of the most disastrous fulminating types of appendicitis.

How are they to be told apart is one of the questions which perplex the diagnostician. Speaking generally, the ordinary stomach ache is acute, and passes off rapidly, perhaps with an attack of diarrhea and vomiting, or not. It is rarely associated with a rise in temperature, and in passing off it usually does so at once and is done with. Further, although the rule is not absolute and pain is apt to be general and usually passes to the left side as the colon becomes the localized seat of the diarrheal disturbance. In the appendix stomach ache, however, there is a marked rise in the temperature, it rarely passes off, not to recur again, and the after pain tends to gravitate towards the right side, often in its typical position, sometimes over the gall bladder, rarely higher up, suggesting even a pleurisy. A sign of value then ever present in children is a sense of discomfort when the little patient "stretches" the lower limbs. This is rarely present in ordinary stomach ache.

The appendicial faces of these younger patients is a useful diagnostic indication of the severity of the appendicular involvement. A flushed face, inclined to duskiness, black lines beneath the eyes, a furred tongue, and evident distress, taken in conjunction with the ordinary signs, these carry a very definite meaning, and yet at times the boy who says he is all right, whose symptoms have improved and who wants to be "let alone" may really be suffering from a toxemia, and gangrenous perforation be imminent. Decrease of pain is a deceptive sign, it may mean improvement, it may mean benumbing of the patients sensory nervous system from toxemia.

With reference to temperature. In the young this is extremely deceptive. A fall from 102° F. to 99° F. with apparent improvement is extremely common. Yet it is not to be relied upon. One of the commonest precursors of gangrene in these patients is decrease of temperature. A gradual fall is nearly always a good sign, a sudden fall means something more serious, beware!

PREVENTION OF SUMMER COMPLAINT.

Coincident with the return of hot weather in mid-summer and autumn a large number of infants and children are attacked with a serious bowel disorder usually termed "summer complaint" and many of the little sufferers succumb to this disease. While the disease is more or less dangerous, owing to the surrounding environment and the condition of sanitation present the disease can in a large measure be prevented.

Any physician, who pays any attention to surroundings cannot help but having noticed that when a large number of children are sick with summer complaint, he will also observe myriads of the common house fly present, and there is no doubt that the house fly is an important factor in the spreading of this disease. This pest, as you know, feeds on, and breeds in all sorts and descriptions of decomposing filth, such as decaying garbage, manure from stables, cow pens and pig stys, etc; that it may carry away some of this filth on its legs and body, being literally covered with millions of death producing germs; flying from some one of these filthy places, it may alight on food, especially the baby's milk, which will be at once contaminated and rendered unfit for the infant's consumption. The only safe precaution against this form of contamination is fly-screens in all doors and windows, fly-paper in kitchens, pantry, and store rooms. Milk for the baby should be kept in a darkened refrigerator where flies have no access. In country places all vegetable refuse, decomposing animal matter, parings from fruit and vegetables if not fed to hogs should be promptly burned, and not thrown out on the ash heap to undergo decomposition in the sun and furnish a nidus or incubator for the propagation of the house fly.

THE FLY SEASON IS THE DIARRHEA SEASON.

Very few babies who receive their sustenance from the breast ever succumb to this disease, therefore it is of the greatest importance that all children should be breast fed, and where a mother cannot give her offspring sufficient nourishment, she should be advised not to take her babe from the breast, but to augment the breast feedings with alternate bottle feedings. Advise your clientele, that on no account to attempt to wean a baby during the hot months of July, August and September. If a mother's milk becomes scanty, prescribe a galactagogue, build up the mother's general condition, and supply any deficiency with good fresh cow's milk. Avoid condensed milks (especially the cheaper brands.) When cow's milk is used, it should be boiled when it comes into the house and immediately placed in the refrigerator. The baby's bottle should be kept scrupulously clean, it should be boiled in a mild solution of sodium bicarb at least once each day, and any milk that is not absolutely fresh should be rejected.

PEDIATRICS

ORIGINAL ARTICLES

APPENDICITIS IN CHILDREN.*

BY

ISAAC WOOD, M. D.
Kingston, Ontario.

We know of no other subject, in the range of Medical Science, that requires more careful consideration from both the physician and surgeon than "Appendicitis in Children." The term "children" in this paper shall include all under fifteen.

For more than a century the ablest men of our profession have been devoting earnest thought and effort to the diagnosis and treatment of this disease and yet it is today responsible for more deaths than any other acute abdominal lesion.

The history dates back almost a century, in 1812 Parkinson, a London physician, reported the first case of death from perforation of the appendix in a boy five years old. Villermay in 1824 reported two deaths in children, after a brief illness and in each case the autopsy showed a gangrenous appendix. In 1837 Bohr reported a case of perforated appendix in a boy ten years old, and Burne in 1839 recorded a similar condition in a child of fourteen years.

About this time Melier, a French Physician, collected five cases, all of which occurred within a short period, and in his report of these he suggested:—

1st. These conditions may not be so rare as they are supposed to be.

2nd. The appendix-caeci may be the primary seat of the disease.

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*Read before the Forty-third Annual Meeting of The Canadian Medical Association, Toronto, Canada, June 1st, 1910.

3rd. Chronic suppurative tumors in the right iliac fossa, may result from a primary lesion and perforation of the appendix.

4th. The possibility of surgical interference for these conditions may some day be conceived.

Melier's conclusions deserved greater recognition than was accorded them. He was evidently living in advance of his generation.

An important contribution to our knowledge of the subject was made by Goldbeck and Albers, who after careful investigation of the origin and location of these inflammations, in the right iliac fossa, introduced the terms typhlitis, peri-typhlitis, caecitis, etc.,to distinguish the several types of the disease. Up to this time the treatment, of these chronic inflammations of the appendix caeci was incision and drainage, but not before fluctuation appeared. In 1848 Hancock, an English surgeon diagnosed inflammation of the appendix and incised the mass without waiting for fluctuation, and to him must be accorded the honor of introducing the modern method of treating a diseased appendix.

Dr. Willard Parker, a well known surgeon of New York, was the next to report a series of four cases, treated by incision and drainage, one at least, before fluctuation appeared. From his observation of these cases he concluded:

1st. That nature endeavored to throw a protective wall around the abscess.

2nd. That there was danger of this wall being ruptured by ulceration or over distension.

3rd. That "a timely incision should be made, neither too early nor too late—not before adhesions had fully formed, nor after a short period before the maximum formation of pus had been reached, that is from the fifth to the twelfth day." He further remarked that "gangrene and perforation were much more frequent in children than in adults and were more dangerous because of the more rapid progress of the disease in children."

Parker's paper published in 1867 marked a great advance in the evolution of our knowledge of the true nature of disease of the appendix, its pathology and treatment. The Willard Parker operation came into general use and the treatment became, more and more, a question of surgery. Up to this time, the writers were no doubt, earnest seekers after the truth.

They made careful and accurate observations but they did not seem able to interpret or correlate the facts they observed. Their knowledge of typhlitis, peri-typhlitis and caecitis was vague and indefinite, and their conceptions of the origin, the pathology and the location of these conditions were in the suggestive rather than the positive stage. It remained for Reginald Heber Fitz of Boston to dispel the mists, clear away the misconceptions and bring order out of confusion. The essential features brought out in his paper (*Amer. Jour. Med. Sci.* 1886 Vol. 92 P. 32) were:

1st. That all these obscure conditions, known as typhlitis, peri-typhlitis, caecitis, etc., were only different stages of a morbid process beginning in the vermiform appendix and that the word "appendicitis," used for the first time in this paper, was "coined" by him to call attention to inflammation of the appendix, as the primary lesion.

2nd. That an early diagnosis was imperative.

3rd. That operation should immediately follow diagnosis.

4th. That the diseased appendix should be excised. This paper, published twenty years later than Parker's introduced a new and progressive era in the history of our subject. The literature of appendicitis has increased rapidly and our knowledge has been wonderfully enriched. More than 3000 journal articles besides books and monographs have been indexed in the Surgeon General's Library at Washington since 1896.

In the study of this literature one cannot but note the almost complete absence of any special reference to appendicitis in children. With few exceptions, recent writers have treated "appendicitis" as a disease common to all ages. Books written by Morris, Fowler, Deaver, Ochsener and others are replete with information, on other aspects of the disease, but not a page or possibly even a paragraph is found to differentiate appendicitis, as it occurs, in children and in adults. Among the exceptions I may mention that Howard A. Kelley has given in his 1909 edition of "Appendicitis and Diseases of the Vermiform Appendix," an excellent chapter on appendicitis in children, and for many of the facts in this paper I am indebted to this valuable work.

If we turn our attention to those special features which differentiate appendicitis in children and in adults:—

Anatomically, we find, 1st. That the appendix in the child is relatively larger and longer. 2nd. The walls are thinner, the meso-appendix is shorter, often less than half the length of the tube. This tends to kink or bend the appendix and to limit the blood supply, especially to the distal half. 3rd. The entrance from the caecum is funnel shaped, the lumen is larger, the mucous membrane smoother and the valve of gerlach often absent or ineffective, hence foreign bodies or morbid materials more readily find their way into the tube. 4th. The lymphoid tissue in the appendix of the child is more abundant and the blood supply is poor, hence destructive processes go on more rapidly and the liability to gangrene and perforation is greater. 5th. The omentum is relatively smaller and less effective in walling off a gangrenous or perforated appendix.

Pathologically. We note, 1st. These inflammations of the appendix induce a greater effusion of serum in children than in adults. 2nd. That this effusion quickly becomes purulent. 3rd. The occurrence of gangrene and early perforation is more frequent in the child. 4th. That abscesses are more likely to form and to rupture in children than in adults. 5th. That there is greater tendency to spreading peritonitis (Sprengel found 46.8 per cent. among his cases.) 6th. That intoxication, of the system, is more rapid and intense in children.

Clinically. These differential features assume more than ordinary interest and importance. We have not time to discuss them in detail. We simply mention some of the general principles. 1st. That appendicitis in the child is more sudden in its onset, rapid in its progress and intense in its symptoms than in the adult. 2nd. That the unstable condition of the nervous system (peculiar to children) may lead to confusion or error and may delay or prevent a positive diagnosis. 3rd. That abnormal conditions are frequently met with in children which render the clinical phenomena vague and misleading, for example right sided pleurisy or pneumonia may simulate appendicitis—the pain, tenderness and rigidity being located in the right iliac fossa. Or in abnormal positions of the appendix (common in children) the pain and other symptoms may be found on the left side of the abdomen—in the epigastric region or under the costal arch.

We feel that a due appreciation of the anatomical, pathological and clinical features already noted should enable us to not only differentiate appendicitis in children from the same disease in adults but to set it apart as a subject for special and separate consideration in its diagnosis, its prognosis and treatment.

We are told by eminent authorities that "the diagnosis of appendicitis is generally easy." This may be true in adults—it is not true in children. The recognition of appendicitis in the early stages—when operation would be successful—is extremely difficult. The cardinal symptoms of appendicitis—sudden acute pain in the right iliac fossa, tenderness over McBurney's point, rigidity of the right rectus muscle, vomiting, elevation of temperature, acceleration of pulse, etc., which are quite constant in the adult, are irregular, uncertain and have little diagnostic value in the child.

The prognosis of appendicitis in the child ought to be good. Compared with the prognosis in the adult it is bad, very bad. In 1907 the average mortality for children in six large clinics was 19.23 per cent., for adults it was 2.9 per cent.

Dr. J. B. Murphy says "We should have no deaths from appendicitis" but we have them. What are we going to do about it? Where does the responsibility rest for this terrible mortality, this veritable "slaughter of the innocents?"

From a careful review of the literature of appendicitis and from observation we have come to the following conclusions:

1st. That the occurrence of appendicitis in children is much more frequent than it is generally supposed to be. Selter found that appendicitis was seven times more frequent before the age of fifteen than it was from fifteen to thirty. 2nd. A large percentage of cases that occur are not diagnosed. 3rd. A large percentage of cases are diagnosed too late for successful treatment. 4th. That the current literature of appendicitis should be revised and those features of the disease, peculiar to children, should be clearly set forth and strongly emphasized. 5th. Our "diagnostic senses" should be awakened and trained to recognize the earliest, the initial symptoms of the disease.

6th. Physicians and Surgeons should be made to realize that an early diagnosis is imperative in the case of children. 7th. That diagnosis should be followed immediately by operation.

THE NURSING MOTHER FROM THE BABY'S STANDPOINT.*

BY

A. W. MYERS, M. D.

Milwaukee, Wis.

In considering the newborn child we must frequently remind ourselves that we are not dealing with a completed organism but with one which has merely progressed to a stage when separate existence is possible under favorable conditions. After birth development goes forward smoothly and continuously in the various systems as the child's organs adjust themselves to the new conditions and tasks which confront them. But there is one change which takes place immediately after birth which is without a parallel in the whole after-life of the child. During the first few hours the intestinal tract which has contained until this time only the sterile meconium is invaded by bacteria, entering from the surrounding air, and in from twelve to twenty-four hours these are carried by the aid of the peristaltic movements throughout the whole length of the digestive tract, so that infection of the entire contents of the intestine is effected. This bacterial invasion can in no way be prevented and there is no need of taking measures to delay it. As it is inevitable the sooner the bacteria become domesticated the better it is for the child. But as the bacterial flora depends largely upon the nature of the nutritive substances found in the gastro-intestinal tract it is of the utmost importance to avoid giving anything which might favor fermentation or in any way lead to a disturbance of the normal process of invasion.

How easy it is to cause a disturbance by the use of improper food at this period is strikingly indicated by an interesting observation made upon calves by Jensen which is quoted by Czerny and Keller in "*Des Kindes Ernahrung*": "A feeding of boiled milk to calves as the first meal will in most cases call forth a severe and sometimes even hemorrhagic diarrhea, which as a rule ends in death and presents, the same picture both pathologically and bacteriologically as the typical acute dysentery of calves. This observation was first made at several farms where there had been no severe diarrheal troubles until with the introduction of tuberculin testing the custom arose of feeding the calves from birth on boiled milk. Between 80 and 90 per cent. of the calves thus fed died. Later it was observed that it was only on the first day after birth that the calves were so sensitive to the boiled milk; if they received only colostrum on the first day they were able to tolerate the boiled milk on the second day without difficulty. These observations were confirmed by numerous feeding experiments. This great sensitiveness, or better, this slight resistance to the colon bacillus is lost in the course of a few days."

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*Read before the State Medical Society of Wisconsin, Milwaukee, June 24, 1910.

Escherich has shown that the first bacterial forms demonstrated in the intestinal contents of infants vary with the nature of the air bacteria in the room in which the child lies, but by the end of the first or the beginning of the second day of life a fairly typical bacterial picture is presented in which the bacillus lactis aerogenes predominates in the upper portion and the bacillus coli communis in the lower portion of the gut. Czerny and Keller maintain that even the addition of sugar to the sterile water which may be given during the first two days is not without danger, and they assert that if any substance is to be added at this time it should be only a small quantity of saccharin.

This leads us to a consideration of the fact that from the baby's point of view the normal delay in the establishment of the milk secretion is in every way desirable as it permits the bacterial invasion to proceed in an undisturbed manner and allows the intestinal tract to loose its sensitiveness to its new inhabitants before the introduction of any considerable quantity of food gives an opportunity for fermentative changes. And in those cases in which it is known from the beginning that artificial nourishment is to be used, as in cases of maternal death or maternal tuberculosis, the considerations mentioned above point to the necessity for withholding milk mixtures and giving only water for the first thirty-six or forty-eight hours.

In institutions for the care of young infants when one inquires into the histories of the methods of feeding employed during the early weeks of life one frequently encounters the statement that the mothers did not nurse their babies because "the doctor said if it could not be kept up for more than a few weeks it was not worth while to nurse it at all." Now I want to protest with all the emphasis at my command against the giving of any such advice by members of the medical profession. It is exactly at this period that maternal nursing is of the greatest importance to the future welfare of the child. The work of breaking down the complex fat or proteid molecules of the artificial food, their reduction to the simpler bodies or "building-stones" of which the Germans speak, and their reconstruction into the fats and proteids of the human tissues is a work for which the digestive tract of the newborn infant is poorly prepared. By thrusting this work upon it before it is sufficiently developed an injury is frequently inflicted upon the gastro-intestinal tract which may appear only in the form of delayed progress at first but which may manifest itself later in the form of an atrophy or marasmus of a most intractable character. At birth the digestive system is developed only to the point of successfully handling human milk which requires a much less profound reconstruction to transform it into the infant's tissues. The process of development is rapid, however, and even if the breast feeding has to be discontinued at the end of two, three, or four weeks, the infant is far better prepared to handle an artificial food than it is at birth. This question arises chiefly in connection with illegitmate children but it is not uncommon to encounter cases in which the father has died or has deserted his family before the birth of the child, leaving the mother to support the family. In cases of this character, whether the child is legitimate or illegitimate, it would be far wiser and more truly economical to provide means whereby the mother may perform her duty to the child for a period of at least four or six weeks, rather than to attempt to deal with the infant alone after it has started on its long and frequently expensive journey through chronic indigestion to death from marasmus.

What Oliver Wendell Holmes wrote many years ago about feeding babies is true today: "We are willing to give Liebig's artificial milk when we can not do better, but we watch the child anxiously whose wet nurse is a chemist's pipkin. A pair of substantial mammary glands has the advantage over the two hemispheres of the most learned professor's brain, in the art of compounding a nutritious fluid for infants." There are times however when the co-operation of the hemispheres of the physician's brain with the substantial mammary glands produces a result far superior to their unaided efforts.

Looked at from the baby's view-point a mother's chief function is to provide a sufficient supply of milk, nourishing in character and yet easy to digest. Sentiment does not enter into his character at this stage and the mother's likes and dislikes in the way of diet have to be subordinated to his digestive comfort. And this matter of comfort in digestion is peculiar to the individual baby. What is perfectly tolerated by one infant may cause acute distress in another child of the same parents, or in the child next door. I have sometimes been told by physicians that what the mother eats makes no difference to the baby at the breast and in some cases this seems to be almost true. But as far as my experience goes, cases of this character are the exception and in the majority of instances the comfort and well-being of the child are intimately connected with the choice of the mother's diet and the manner of her life Of course there are mothers who have no milk at all, and there are others whose mammary glands become exhausted after a short period of activity, and there doubtless are some whose milk cannot be made to agree with the digestive powers of their offspring, but when the diet and the hygiene of the mother can be controlled it seems to me this last class becomes so small as to be almost negligible.

There are three classes of errors into which nursing mothers frequently fall which I wish to mention briefly: First among these is that of too frequent nursing. In most of the text-books it is stated that during the first few weeks of life the baby should be nursed every two hours during the day with one longer period of rest of four or five hours during the night. This has come to be considered what might be called a standard nursing interval during the first two months or even for a longer time. In addition it is usually said in the books that the baby should be established in regular nursing habits as soon as possible by taking it up at the time fixed for the next feeding whether it is awake and hungry or not. It seems to me that both of these plans are more honored in the breach than the observance. Under ordinary circumstances three hour intervals between feedings during these early weeks makes life much more comfortable for both mother and child and the baby's gain in weight will be quite as rapid as when more frequent nursings are employed.

As to the question of awakening the child at regular intervals for feeding each individual case must be decided on its merits, but it seems to me that the results of letting the child sleep as long as it wants to have been so satisfactory that I should hesitate to change. There are some children who show a tendency to turn night into day by sleeping for long periods during the day and waking frequently at night. In cases of this type it is well to rouse the child regularly for its feedings during the day in order to try to secure the longer period of sleep during the night, but in ordinary cases there seems to be an unusual freedom from digestive disturbances when the child is allowed to sleep as long as it will and even when the number of nursings is reduced to four or five in the twenty-four hours the gain in weight is normal.

A second source of trouble frequently encountered is the over-feeding which nursing mothers commonly indulge in, in an effort to make the milk richer and more abundant. The following case illustrates so well the train of events typical of this condition that its recital will save time: Baby X., 5 weeks of age, was the first child of young and healthy parents. The mother had an abundant supply of milk and the baby was gaining in weight but was very constipated. The child had had a great deal of colic almost from birth and rarely slept more than half or three-quarters of an hour at a time. As the baby usually began to cry a short time after nursing and tried to swallow his fists he was supposed to be hungry and was nursed every two hours while the mother began drinking milk of cocoa between meals in order to increase the richness of her milk. On account of the baby's restlessness the household was in constant commotion and the mother had no chance for undisturbed sleep at night or to go out for exercise during the day. The mother's milk was found to be unusually rich. Here you see a vicious circle had been established, each link aggravating the disturbance caused by its neighbor.

All that was needed to restore peace and comfort was to break into the circle by giving the mother one night's good rest, substitute water for the milk and cocoa which had been taken between meals, provide for regular daily exercise, lengthen the intervals between nursings to three hours, and provide for the temporary relief of the constipation which speedily corrected itself.

Another phase of this same error is seen when an excess of fluids is taken by the mother during the first few days of lactation, before the milk secretion is thoroughly established, and before the child is nursing vigorously enough to thoroughly empty the breasts. Under these conditions varying degrees of engorgement are encountered, sometimes amounting only to temporary discomfort, at other times resulting in inflammatory processes leading to mammary abscess formation.

The third frequent error from the baby's standpoint is the lack of care on the part of the mother in the selection of her own food, especially shown in the too early or too abundant use of fruits and vegetables. It is a mistake to assume that errors of this character will always make themselves manifest in the form of colic. They usually do but not invariably. Sometimes the baby may suffer no discomfort but the character of the stools will be abnormal or their number may be increased. In a case seen not long ago a baby of six weeks had always been breast fed and the mother had been on a carefully limited diet on account of an eclamptic attack following parturition. The baby developed a severe diarrhea with fifteen to eighteen stools daily, all of them containing mucus and some of them blood, which speedily reduced the child to an alarming condition. On questioning the mother it was found that she had been taking a little orange juice or some apple sauce almost every day at the time the baby's digestive trouble began. When these were discontinued the diarrheal disturbances gradually ceased although the gastro-intestinal tract had been so profoundly disordered that the return to normal was rather slow. I know of no particular in which the digestive systems of infants show greater differences than in respect to their tolerance of fruit and vegetables in the mother's diet. No general rule can be laid down, each case must be studied individually. And in the study of the individual case from this point of view the chemical analysis of the milk gives no information whatever. The clinical picture and the results of adding or withholding different articles of food in the mother's diet are the only dependable guides to a solution of this problem. The mucous membranes in time undergo a process of habituation or hardening so that subatances which at first produce a severe reaction, eventually cause little or no discomfort. For this reason articles of diet which might cause great distress at three weeks may be perfectly safe when the baby is three months old.

Of course this does not exhaust the list of the mistakes babies discover in the conduct of their mothers but it includes a very large proportion of them and while these considerations may seem elementary to some they are so frequently responsible for causing a divorce between the baby and the breast on the ground of incompatibility of temperament that it seemes permissible to bring them up for discussion today.

141 Wisconsin Street.

TREATMENT OF POTT'S DISEASE AND COMPLICATIONS

Translated from Le Journal de Medicine et de Chirurgie, Montreal, by

FREDRICK S. MASON, M. D.,

New York City.

Many discussions on the treatment of Pott's disease have taken place within the last twenty years and this is a subject which interests all of us, for it is a very frequent condition which we find in our patients. Most of the cases never see a specialist and refuse to take any notice of it until their case becomes hopeless. If, however, the case is recognized and cared for, the prognosis becomes much more favorable since we are now able to cure a number of cases by simple technical methods within the reach of all practitioners. I do not speak of the general antitubercular treatment indispensable for such patients. I will only refer to the local treatment.

The first thing should be complete rest in a lying-down position, not only during weeks but even months and years; that is to say, during the whole acute period of the affection.

The patient should lie flat, without a pillow, and the mattress should be horse hair, and the frame bed should be so arranged as to be easily transported outside into the air where the patient can live from morning 'til evening.

Second in importance to rest, is the application of a plaster apparatus, for Pott's disease means a fracture with a tendency to displacement of the fragments, and therefore a plaster casing is necessary, but even this does not guarantee us against the possibility of a curvature, if it does not already exist. Consequently, the case of Pott's disease should immediately be put in plaster.

According to the author, M. Galot Berck, there are two models of the plaster corset: "*a grand col*," with a funnel shape opening on which the base of the head may rest, and "*a petit col*," having the form of an ordinary linen collar. The first is used for Pott's disease having its seat above the sixth dorsal vertebra and for all cases of paralysis without designation of its site. The second suffices for Pott's disease situated below the sixth dorsal vertebra.

(a). *Le petit platre.* We begin with this one which is easier to make and most frequently employed. It is constructed while the patient is in an upright position, holding him up but without suspension.

L'appareil de tension, with a pulley fixed to an ordinary suspension hook, or still more simply, a cord which is attached to one of the rungs of a double ladder. The end of the cord sustains a transverse triangle to which the subject is attached by a collar supporting the base of the skull with two bandages and three pins. It is easy to arrange this; a *sangle belt* replaces advantageously all other orthopedic collars.

With a bandage from 20 to 30 centimeters longer than the hight of the patient, the two ends being tied, we have a surface on which a buckle for holding the head in position may be arranged. The dimensions of this buckle are so limited as to bring the middle of the bandage over the face of the patient from one ear to the other in such a manner that the fingers can respond to the auditory orifices, and the two ends are united in this position by two safety pins.

The buckle so obtained will pass with slight friction around the head under the chin and occiput, and in drawing on the cord of the apparatus, the *sangle* will hold the head in position without deranging the bandage. When this is drawn on, the chin is brought up above the normal level. In order to correct this, I use a second bandage about a meter long which is pinned from one extremity to the middle of the posterior portion of the median buckle, and in drawing on the other extremity which is free from this bandage, the head is brought forward or backwards as desired. The chin can be thus let down to its normal level; that is to say, the union of the third and fourth cervical vertebra, and the head is fixed in this attitude by tying either extremity of the bandage around the middle part of the triangle. The ears are protected against pins by two squares of wadding. Now draw on the cord until the heels leave the ground. The idea is to hold the patient up but not to suspend him.

Thanks to this formula, we never cause traumatism in debilitated subjects. This tension instead of fatigueing, aids the patient, while insuring a correct position of the trunk.

In order to protect the skin of the hands against direct contact with the plaster, the patient is covered with a jersey, and this is completed with a circular cravat made with three folds of soft muslin and a square of wadding about a centimeter thick placed over the chest.

Now it is necessary to apply the bands and *attelles platrees* (plaster harness.) These are to reinforce the arrangement and consists simply of fragments of *tarlatan* dipped in plaster.

The first covering is made with one or two bands which are rolled around the shoulders in the figure eight, and a circle around the rest of the trunk, and then apply the *attelles* of which there are three, one for the back, one in the front and one for the neck.

The *attelles* harness for the back and front should be of the same length, one and one-half times the total length of the trunk and the same width, which is equal to half the circumference of the trunk. The thickness should be that of three sheets of *tarlatan*, that for the neck should be of the same thickness as the others and equal to the height of the neck and as long as its circumference.

These should be dipped in plaster made in the proportions of five portions of plaster and three of water without salt. Squeeze them a little and apply, spreading it out. First the posterior *atteile* of the superior third is cut in two equal parts, each one passing through the corresponding shoulder, falling over it, finishing in the axilla, it is then attached to the dorsal part of the same *attelle*. The anterior *attelle* is now applied, its superior border corresponding with the clavicles, and covering over the two heads, its inferior third hanging as an apron below the pubis.

Then fold it over the abdomen covering over the medium third. The *cravat* is applied exactly like a collar, but without pressure above the *attelle.*

A second and third covering is made with bands rolled as in the preceding. Between the diverse layers of the apparatus, a fine layer of plaster is placed, which acts as mortar to consolidate all pieces, then, over the last, a coating of plaster *bouillie*, and this suffices to terminate the work. All that has to be done now is to verify the position of the trunk, and to rectify it if necessary, and to hold the plaster around the hips. For this purpose the iliac crests should be covered with the hands and with the extremity of the fingers, make a deep depression above the crests, and also a little below the external iliac fosse in order that the spine and crests may be in apposition to the depressions of the apparatus, holding the whole until the plaster becomes solidified, which we are able to tell by noticing whether it will yield a pressure on the surface. This may be rather tiresome, but it is essential, for if the hands are removed before the plaster is solidified, the apparatus may make a plait.

It should never be opened. Twenty years ago, out of twelve cases of Pott's disease opened and curated by competent surgeons, Cazin of Beroke, had eleven of twelve die within a year after this intervention and the twelfth died the following year.

After the operation, a fistula only remained and this fistula is certain to become infected, usually leading up to mortal visceral degeneration. If the abscess is deep and inaccessible, abstain from operations and wait for reabsorption and the spontaneous cure of the abscess which may come and which usually does come three times out of four, if the patient is submitted to a good general treatment and rest.

The case in point may be cited. A little girl came to this hospital a year ago with a big abscess as large as the fist, situated in the right iliac fosse, planted against the vertebra column and almost inaccessible. Mr. Robin did not touch it neither did I. Today, after a year, this abscess is completely cured, without leaving even a trace. It is only when the disease threatens the skin that you may and should touch it, not to cut down on it but to puncture it. Recently in a neighboring hospital, an abscess from Pott's disease was punctured twice. On the third occasion it gave no pus. The needle became obstinate and it was thought necessary to open it and drain. This is a great mistake which will probably be fatal to the patient. Wait in such cases for eight days for evacuation of the pus, and with patience, this usually suffices. When the abscess is situated in the thigh or in the back, you have nothing to fear, but this is not the case when it is in the internal iliac fosse, which, unfortunately, is very frequently the case.

In these situations it is necessary to be very careful to avoid the large vessels, to say nothing of the peritoneum and the intestine. We can avoid the large vessels by bearing on the external quarter of the crurale arch and so avoid the peritoneum and intestine bearing outside of the crurale arch. For example, one-half centimeter above it.

At this point, and very near to the superior iliac spine, we can thrust the needle directly from above, behind, slightly obliquely, 20° of obliquely from the outside in and from below above the needle. We adopt the needle to the aspirator, or the vacuum is made in advance, and the pus immediately comes out. After the puncture, the needle which remains in place is used to introduce a modifying injection. When an abscess is treated in this manner, beware of infection and insure a strict asepsis, making punctures not oftener than fifteen or twenty days.

ANOTHER CASE OF STATUS LYMPHATICUS

BY

LESTER W. DAY, M. D.
Minneapolis, Minn.

L. M., aged one year seven months, twelve days, female, this child was delivered by me and from the date of birth was always well, rosy and fat with normal respiration and apparent freedom from enlarged tonsils and adenoids. For three years beginning August, 1903, the father was treated actively by me for Syphilis, at the expiration of which time I consented to his marrying, no evidence of syphlilis having appeared for over a year and one-half. The paternal history is otherwise good.

On the naternal side an uncle began having elipeptiform convulsions at four years and he died an epileptic aged thirty-five. Besides a history of carcinoma in the family it is otherwise negative. The mother and her maiden sister are both perfectly well.

On Apri 24th, 1910, the child was perfectly well all day, happy and bright. On April 25th, it woke up and asked for a drink of water which it promptly vomited. It was dressed and taken into the dining room where it ate some toast and drank some orange juice. Vomited shortly after eating. During the morning it asked frequently for water, which, however, it could not retain, vomiting in all seven or eight times. In the afternoon, the mother gave her a dose of castoria which was vomited, but later in the evening another dose was given which was retained. The child apparently was not in pain nor did the mother, an intelligent woman, think it very feverish.

About midnight the mother called me up on the 'phone and talked over the case, but was not alarmed, thinking that as soon as the bowels had moved thoroughly, all would be well. During the night the child was very restless, would moan but did not cry out, and the mother noticed that it would only lie upon the left side. When I arrived at 10 A. M., April 26th, the child seemed dull and sick and while undressing it, I noticed a convulsive twitching of one of its hands and almost immediately afterwards it went into convulsions. This convulsion seemed unusually long as we were able to undress it, take it to the bathroom, fill the tub with hot water and still the convulsion continued. In the bath I noticed that all the movements were made with the right arm and leg, while the left arm and leg remained still. The child became purple and frothed at the mouth, and I thought it was going to stop breathing. Gradually there came a relaxation, respiration became quiet and even but the paralysis remained in the left side. The child was wrapped in warm blankets and apparently went to sleep.

About 12 o'clock Dr. Geo. D. Head, who had been called as consultant, arrived and we went over the case together. The temperature per rectum was 104°. Pupils reacted to light (we could not determine accommodation) heart and lungs apparently normal; skin not scyanosed but on the contrary reddened by the hot water and flannel blankets. No inflammation of pharnyx or tonsils, no inflammation of ears. There was paralysis of left arm and left leg and a suspicion of paralysis of the left side of face. The left arm seemed somewhat spastic, was drawn up and the wrist flexed on the right shoulder. It could be drawn down against resistance but would gradually return to the same position, but the reflexes were greatly diminished.

There was slight response to irritation of the sole of left foot in the form of a partial Babinski reaction but reflexes were apparently otherwise absent. Anesthesia was also present over the affected side. Reflexes all normal on right side. There were no evidences of bulbar or respiratory involvment. Because of the epidemic of Anterio Poliomyelitis that we had had the preceding summer, we thought that we had an unusual case of Anterio Poliomyelitis to deal with, but decided for the sake of diagnosis to do a lumbar puncture.

We left at 1 P. M. to return at 2 P. M. but the child was taken with another convulsion and died at 1:45 P. M. I was notified by telephone of the death and arrived about 3:30 to find an undertaker at work embalming the body. Fortunately, I was able to stop this work and Dr. H. E. Robertson of the Pathological Department of the University of Minnesota performed the autopsy. Which with his permission, I give his report.

Clinical history and diagnosis—age one year, seven months. sex, female; color, white; specimens preserved, brain, cord, portions of intestines and mesentery

External Appearances. Body that of a well developed well nourished famale infant, 82 cm in length. A wound in ths left thigh covered by surgical tape marks the site of what wa, said to have been a post-mortem injection of embalming fluid by an undertaker. No evidence of cavity embalming. The body is still warm, rigor being very slight and post-mortem lividity not present. The pupils are 4 mm. and equal. There is no edema, cyanosis or jaundice.

Peritoneal Cavity. Surfaces smooth and glistening throughout. Mesenteric lymph nodes are abnormally enlarged, the two folds of mesentery being plainly shown by the two layers of swollen lymph nodes. These are largest near the upper portion of the mesentery, especially around the root of the celiac axis, at which point many of the nodules are fully 2 cm. in diameter. Their cut surfaces are soft, pinkish, and free from evidence of gross lesion. Diaphragm reaches fourth space on right, fifth rib on left.

Pleural Cavities. On removing sternum, thymus is very prominent, each lobe extending from the base of the thyroid gland to the apex of the pericardium. The cavities are free from abnormal fluid and adhesions.

Pericardial Cavity. Contains a few c. c. of clear yellow serum.

Heart. Normal in size, weighing 40 grams. Muscle valves, and endocardium are apparently normal. Foramon ovale is closed. Root of aorta measures 3.3 cm. in circumference and is normal.

T V–6 cm. PV–3.5 cm. Depth Rv–4 cm. Thickness Rv–.3 cm
T V–5 cm AV–3.3 cm. Depth Lv–3.5 cm. Thickness Lv–.8 m.

Lungs. Normal appearances are partially changed by presence of embalming fluid. Occasional small pin-head size, subpleural hemorrhages are present over the surfaces of both lungs, especially the lower lobes. There is no evidence on cut surface of abnormal nodules or congestion or edema.

Spleen. Increased in size, weighing approximately 80 grams. Pulp is firm, dark purplish red in color. On section cut surface is thickly mottled by pale greyish points. Pulp is friable but does not readily scrape away.

Liver. Normal in size, surface smooth. Pulp congested and slightly cloudy. Gall bladder and ducts normal.

Pancreas. Apparently normal. Entire pancreas is surrounded by swollen lymph nodes, varying from .5 to 1.5 cm. in diameter, being relatively much increased near the tail.

Gastro-intestinal Tract. Stomach contains a few c. c. of greenish colored fluid. Beginning at the upper portion of the jejunum, increasing in number, size and prominence as far down as the ileocecal valve, are swollen, hyperplastic Peyer's patches with intervening large, prominent solitary follicles. These Peyer's patches have corrugated surfaces and are slightly congested both over the surface and at the pe iphery. Some of them are fully 3 mm. above the surface of the intestine. They vary in size from 4 x 1 to 2 x 1 cm. Near the valve is almost a continuous mass of swollen lymphoid tissue. No evidence of ulceration presents at any point. Solitary follicles in colon are enormously swollen, presenting an almost conglomerate mass of raised, broad, greyish points. Intestinal tract contains a small amount of greenish colored fecal material and mucus. In the meso-colon are numerous small, swollen deeply injected lymph nodes.

Adrenals. Very small in size, the ccrtices being very narrow and the medullae hardly discernible.

Kidneys. Normal in size but their consistence and appearance has been changed by the embalming fluids. On section blood vessels are deeply congested but pulp otherwise appears normal.

Bladder. Contains a few c. c. of urine.

Genital Organs. Apparently normal.

Organs oj Neck. The thymus weighs 28 grams. Pulp is greyish pink in color, soft, and from cut surface small amount of clear fluid escapes. Thyroid is quite small and apparently normal. Examination of trachea shows no evidence of exudate or edema.

Head. Scalp is normal. Calvarium is very thin, being in some places almost paper-like. The fontanelles are closed. On removing skull the dura is found to be quite tense. Owing to difficulties in stripping dura from inner surface of calvarium considerable injury is done to the brain and dura. On incising dura and stripping it from surface of brain, over the right vertex there appears a small, thin, brownish red layer of clotted blood. This is not adherent to either the dura or the surface of the brain and the possibility of its having been squeezed out from one of the torn dural vessels cannot be denied. However, it is flat, brownish red and fairly firm, whereas the clots in the vessels are dark, soft and rounded. The brain is very large, weighing 1090 grams, and vessels of pia-arachnoid are distended with dark blood. The formalin injection alters consistence and appearances so much that conclusions in regard to injection or areas of softening are not able to be drawn. Serial section of the brain after the method of Virchow fails to show any lesion whatsoever, except a possible slight opacity of the pia-arachnoid and in the upper portion of the medulla in the olivary body, on the right side, a reddish, softened spot.

Cord. Examination of the cord shows about 20 c. c. of clear fluid escaping from between the membranes. On incising dura and making multiple transverse sections of cord, aside from slight reddening of anterior horns, no evidence present throughout the entire cord of softening or hemorrhage.

Examination of base of skull, including middle ears shows nothing abnormal.

Diagnosis.—1. Possible subdural hemorrhage on right side; 2. General lymphoid and thymic hyperplasia; 3. Hypoplasia of adrenals; 4. Post-mortem embalming.

Microscopical examination of cord shows no evidence of lesion. Pia-arachnoid of cerebrum is markedly thickened and shows infiltration of cells. Lymph nodes and thymus are undergoing extensive hyperplasia.

H. E. Robertson .M. D.

There are several points of very great interest in this case.

1st: During the life of the child there was not the slightest indication of the existence of Status L mphaticus either by respiratory disturbances, palor, enlarged onsils or adenoids, and its presence could only have been determined by careful percussion over the thymus gland and by means of the X-ray.

2nd: Were the convulsions a result of thymic hyperplasia or was there a hemorrhage in the right side of the brain that caused the hemiplegia and convulsions? Dr. Robertson and I deeply regret our inability to say positively whether there was an antimortem hemorrhage. I am inclined to the opinion that the small clot found was pressed out of the meningeal vessels in the process of exposing the brain. The thickening and infiltration of the pia-arachnoid certainly shows however an i-mortem congestion the cause of which we can not explain.

3rd: In spite of the fact that the child never manifested any signs of congenital syphilis may not the enlarged glands and hypertrophied thymus have been the only manifestations of the dread disease which I congratulated myself on having prevented?

4th: It has been suggested that there is a relationship between epilepsy and an enlarged thymus. Could it be possible that the epilepsy in the uncle was due to thymic enlargement and that this case was transmitted by inheritance?

5th: Lastly I deem it worthy of note that an undertaker should think that he had a right to embalm a body within two hours after death and before the remains had been viewed by a physician.

PEDIATRICS IN THE MEDICAL CURRICULUM IN GERMANY.

Feer (Archiv. fur Kinderulkimbe, Stuttgart) comments on the growing interest in pediatrics, not only in medical circles but in official headquarters. One of the signs of the times is that societies for internal medicine in Vienna and Berlin have recently added pediatrics to their official title. He urges that every medical college should have a hospital for children's diseases, and an infant department connected with it, a special dispensary for children, all in charge of a professor who is a specialist in pediatrics. If this is not possible, there should be at least a special infants' ward, with at least 20 beds. He also urges examination in pediatrics by a specialist in the examination for license to practice.

Castor Oil for Children.—Castor oil will not be objectionable to children if put in a bottle with an equal quantity of pure glycerin, heated, and shaken well. Each drop of oil will be coated with glycerin and rendered almost tasteless.

THE USE OF FAT-FREE MILK IN INFANT FEEDING *

BY
H. H. AMSDEN, M. D.
Concord, N. H.

There is perhaps no subject under consideration by medical men today upon which a greater difference of opinion exists than the artificial feeding of infants, partly because by many physicians arificial feeding is regarded as of little importance, and dismissed with the recommendation of some favorite baby food and left to the care of nurse and mother, but more especially because there is no scientific generally adaptable method of infant feeding, nor is there likely to be until the chemistry of digestion has been placed upon a more scientific basis. The fact that so many infants must be artificially fed nowadays, because of physical limitations of the mothers in the middle and upper classes at least, renders this a problem of great and increasing importance.

Milk is the universal food for the human infant, and in case it is impossible to obtain human milk, in this country at least, cow's milk is the universal substitute. All methods of infant feeding, then, have as their object the modification or adaptation of cow's milk to suit the needs of the individual child. In this country the so-called percentage method is most widely adopted, which was formulated and introduced by American pediatrists, notably Rotch and Holt. A brief statement of the principles of this method and the views of its advocates concerning the chemistry of milk digestion will serve as an introduction to the consideration of the subject of this paper.

An average specimen of cow's milk contains fat 4%, sugar 4.50%, proteid 3.50%, salts .75%, water 87.25%, while an average specimen of human milk contains fat 4%, sugar 7%, proteid 1.50%, salts .20%, water 87.30%. According to the generally accepted views, of these various ingredients the water, salts and sugar are identical as to chemical composition and digestibility in both kinds of milk and give rise to no digestive disturbance; the fat is practically the same and is easily digested unless in excess, which can be overcome by simple reduction in amount; but the proteids differ radically largely on account of the great preponderance of casein over lactalbumin in cow's milk, and if any given specimen of milk of proper percentage composition proves indigestible, the trouble must be due to the proteids. The percentage method is based on this assumption as to the indigestibility of the proteids, and uses as a basis top milk containing a high per cent. of fats and low relative per cent. of proteids, from which by suitable dilution, addition of sugar, skim milk, etc., a milk can be prepared which reproduces the percentage composition of any given specimen of human milk. If this proves unsuited to the infant, an effort is made to further adapt it by changes in the percentages, and this proving unsuccessful, the proteids are to be further modified by predigestion, the addition of cereal gruels, whey or the so-called split proteids, etc. This method was really the first attempt to reduce infant feeding to a scientific basis.

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*Read before the One Hundred and Nineteenth annual meeting of the New Hampshire Medical Society, May 12 and 13th, 1910.

Now there are certain objections to this method. In the first place, it is complicated and no two authorities give the same formulae for calculating the percentages. Unless a careful analysis of the modified milk is made, the physician is by no means certain that he is getting the exact fractional percentages for which the method calls.

Then the amount to be given in any individual case is calculated arbitrarily according to the age of the child, rather than its weight or nutritional needs. The ordinary method of determining a proper dietary for an individual or group of individuals seeks first to ascertain the caloric value of the food, then to establish a proper ratio between this factor and the nutritional needs of the consumer based on the weight, age, occupation, climate, etc. As all infants may fairly be classed together as to bodily activity, heat loss, etc., it follows that given two infants of the same age, in similar surroundings, we are justified in assuming that the one child weighing ten pounds would require more nourishment than the other weighing only five or six pounds.

Another objection to this method lies in the assumption that the modification of milk so as to secure exact percentages makes it *per se* more digestible than simple empirical dilution, or in other words that a fractional juggling of percentages may adapt a given specimen of milk to a given infant without further change; for instance, it is claimed that a child that cannot digest 1% of proteids may be able to digest .75% or perchance 1.25%. A trial of this method has convinced the writer that in case a modified milk disagrees with an infant, it is generally a waste of time to attempt to adapt it to the case by a mere rearrangement of the per cent. of fat, sugar and proteid without adopting more radical measures.

The principal objection to the percentage method is that it assumes that the indigestibility of the proteid is the cause of difficulty in milk modification, and that all efforts must be directed towards overcoming this one feature. This in turn is founded on certain deductions from laboratory experiments on milk, and on analyses of curds found in infants' stools. If two test tubes are partly filled, one with skim milk containing 1% or less of fat, and the other with gravity cream, approximately 16% fat, and rennet added to each, the skim milk will form a tough firm curd, while the cream will form a softer, more friable curd. It is from this experiment that the belief has arisen, apparently, that the casein must necessarily be the principal factor in the formation of the curd. If, however, the test tubes are gently rotated, thus imitating the peristaltic motion of the stomach, the curd will be soft, flocculent and easily disintegrated, that from skim milk being softer and finer than that from cream. It would seem that this test reproduces more nearly the conditions of gastric digestion than the former, and if this be so, there is no good and sufficient reason for assuming that the casein of cow's milk is the cause of the curds found in infants' stools. After all, these tests prove very little as to the digestion of milk in the gastro-intestinal tract, but show that the data upon which the classic assumption as to indigestibility of proteids is based are erroneous.

As to the composition of curds found in infants' stools, Talbot (1), in a series of analyses of large curds found them to be composed mostly of casein, and considers that the soaps, fatty acids, etc., found therein, which vary in amount according to the percentage of fat in the milk, are merely incidental, being mechanically entangled in the curd. Clinical experience, however, tends to prove that the fat rather than the casein is primarily responsible for curd formation. A well-recognized symptom of too high fat percentage in modified milk is the "spitting" of sour curds some time after nursing, this occurring in both breast-fed and bottle-fed infants. It will often be found that in case a mother's milk disagrees, the percentage of fat is too high, and dieting to correct this condition will render the milk digestible. Jacobi (2), cites some cases of this sort, in which 7% of fat was found in breast milk. The same thing is true of some breeds of cows, Jerseys, particularly, whose milk is frequently so rich in fat as to render it impossible for them to suckle their own calves.

It is impossible to obtain a proteid-free cream without destroying its identity as cream, the per cent. of proteid being about the same in skim milk and the heaviest cream, hence we have no data as to the behavior of such in the gastro-intestinal tract, but it is interesting to note that olive oil, which is almost pure fat, will in some cases form soft concretions in the stools, which on analysis are found to be composed of soaps, fatty acids, etc., similar to the curds in infants' stools, and it is probable that their formation is due to an excess of fat in the intestine.

The best proof, however, that the proteids of cow's milk are not indigestible is the clinical test made by feeding fat-free milk to infants. About three years ago there appeared in the Journal of the American Medical Association some articles by Walls (3), and Brennerman (4), based on data from the writings of Heubner, Czerny and Keller controverting the views of the advocates of the percentage method, and expressing some revolutionary ideas on the subject of infant feeding. These articles state, in substance, that infants fed according to the percentage method are almost without exception overfed; that the symptoms of overfeeding are due to an acidosis from excess of fats; that the fats, not the proteids, are the cause of indigestion in milk feeding; and that the amount of milk given should be calculated not on a percentage basis, but according to the ratio between the weight of the infant and the caloric value of the food. A series of cases is cited in support of the above statements in which children suffering from various forms of gastro-intestinal disturbance were fed on fat-free milk, either diluted or undiluted, and with uniformly good results, the stools resulting from this method of feeding being smooth, soft, free from curds and mucus and without offensive odor. The typical skim milk stool is described as of the color and consistency of vaseline. The symptoms of indigestion and acidosis in infants fed on milk mixtures containing too much fat and other modifications of milk disappeared sometimes within twenty-four hours after beginning fat-free milk feeding. Clinical experience would seem to indicate that the fat rather than the casein is generally responsible for curd formation and indigestibility of milk.

A practical question arises as to the cause of the relative indigestibility of different kinds of milk. We know that milk is an emulsion, containing fat in globules of various sizes, each globule supposed to be enveloped in a covering of proteid (lactalbumine). The digestibility of an emulsion is in inverse ratio to the size of its fat globules: the smaller the globule, the more easily digested. Gilbert (5), in some interesting experiments, showed that pigs fed on skim milk thrive better than those fed on milk rich in cream, the latter losing weight and suffering from indigestion; that the milk having the smallest fat globules gave least trouble in digestion and assimilation; that the smaller fat globules were more readily absorbed by the intestinal villi, and *finally*, that the milk from Jersey cows, having the largest percentage of cream and largest fat globules, was less easily digested than the poorer milks, *i. e.* from Holstein cows.

The possibility of modifying the fat so as to increase its digestibility is a matter of interest and importance in this connection. The influence exerted on the fat by the various methods of milk modification offers a field for research along clinical lines which may yield data of value, but the amount of material available to the general practitioner precludes any extensive investigations. It is a fact that beating or whipping a milk mixture for a few minutes seems to increase its digestibility, the reason for which is not apparent. It would seem that any attempt at fat modification must be along the lines of increasing the fineness of the emulsion, yet any mechanical agitation of milk causes a coalescence of fat globules and the emulsion is rendered less perfect thereby, as can be easily demonstrated by microscopical examination of specimens of cream before and after whipping. It is possible that by destroying the proteid envelope of the fat globules they are thus rendered more accessible to the action of the pancreatic secretion and bile, but our knowledge of the ultimate processes of digestion is so incomplete that we can merely speculate as to what actually goes on in the intestine.

Turning now to the practical application of this subject, the method of calculating the amount of milk to be given in any case is based on the energy quotient, to be determined by the relation of the caloric value of the milk to the weight of the infant. It is found by experiment that an ounce of gravity cream, averaging 16% fat, has a caloric value of 54; an ounce of whole milk 21; of skim milk 10; of milk sugar 120; and of cereal gruel 3. By multiplying the number of ounces of the different ingredients by their caloric values, adding the results, dividing the total by the weight in pounds of the infant, and multiplying the result by 2.2 the energy quotient is obtained. This should be about 100 for the early part of infancy, gradually reducing to about 80 at the close of the first year. Heubner states that the minimum amount of whole milk upon which an infant can be kept in nitrogenous equilibrium is one ounce per pound of body weight, the average amount 1.25 oz the maximum 1.50 oz. and if this latter figure is exceeded, symptoms of indigestion are almost sure to follow.

My personal experience with this method of feeding is based on ten cases seen during the past two years. To one accustomed to the use of the percentage method, it takes considerable courage to feed undiluted skim milk to a sick baby, but I can only say that the results obtained have in each case justified the claims made by its advocates, that a skim milk diet will result in the production of smooth salve-like stools, free from mucus and curds, inoffensive in odor, and unaccompanied by colic or constipation.

I wish to cite briefly the history of two of these cases.

Case 1. E.A. of healthy parentage, bottle-fed from birth, given, at first a modified milk, from top milk, lime water, milk sugar and water low in fats and proteids. Child did not thrive on this, curds were always present in the stools, and any attempt at increasing the strength of the milk by addition of more top milk caused colic, curds, mucus, "spitting", etc., with loss in weight and nutritional disturbances. Various percentage modifications were tried, also sodium citrate, gruels, Mellin's food, malted milk, whey, gelatine, egg albumen, broths, peptogenic milk powder, etc., with the same unsatisfactory results. Finally a mixture of skim milk and water, equal parts, with milk sugar and lime water was given and in 24 hours the stools became normal. Small amounts of cream were gradually added until it became possible to use whole milk as a base, temporary derangements of digestion due to efforts at increasing the fats always being overcome by a return to skim milk.

Case 2. M. M. apparently healthy at birth, breast-fed for two weeks and then weaned on account of mastitis. A whole milk mixture was given with good results for two months, when symptoms of hereditary syphilis developed, coincident with which began very serious digestive and nutritional disturbances, and former whole milk mixture disagreed most markedly. Resort was had to skim milk here, which gave results, digestive disturbances disappeared, and child made a good recovery.

It is obvious that skim milk alone is insufficient as a food because of its low caloric value, and it is necessary to add fat in some form, preferably cream. In cases where this disagrees a temporary resort may be had to high percentages of sugar, but it is generally agreed that some fat is needed to avoid grave nutritional disturbances. By beginning with fat-free milk and gradually adding small amounts of cream it is possible to educate the infant's digestive apparatus, so to speak, until it is able to take a mixture containing a due proportion of fat.

My personal experience has led me to believe that in many feeding cases, beginning with a milk too rich in fat, causes digestive disturbances hard to overcome, and that in the great majority of cases we will succeed best by using a clean whole milk with low per cent. of fat and by seeking to establish a proper ratio between the caloric value of the food and the weight of the child. It is useless to expect to gain satisfactory results unless we have a clean milk and know the per cent. of fat therein. In Concord we are fortunate in being able to obtain these essentials largely through our city milk ordinance, and the efficient work of our milk inspector. There is a great variation in the composition of milk given by different breeds of cows, and, as has been stated, other things being equal, that in which the ratio of fat to proteid is least, in other words, a relatively poor milk is best suited for infant feeding. In this part of the country the Holstein cow gives the best milk for these purposes.

In order that the physician may intelligently prescribe a milk mixture it is necessary to know that fat percentage and it may also be desirable to know the size of the fat globules through microscopical Examination.

It is not expected that this method of feeding is the least word on the subject, or is necessarily the best and universally applicable one. The demonstration of the digestibility of the proteids is a most valuable addition to our knowledge of the chemistry of milk digestion, and any method which does away with complicated and arbitrary formulae and substitutes a simple whole milk mixture for artificial compounds proposed by some pediatrists today is indeed welcome.

(1) *Boston Medical and Surgical Journal*, June 11, 1908, p. 905.

(2) *Journal A. M. A.*, Oct. 10, 1908, p. 1216.

(3) *Journal A. M. A.*, April 27, 1907, p. 1389

(4) *Journal A. M. A.*, April 20, 1907, p. 1338

Boston Medical and Surgical Journal, March 19, 1908, p. 379.

(5) *Medical Record*, Oct. 27, 1906.

*THE DIAGNOSIS OF LOBAR PNEUMONIA IN CHILDREN

BY

LOUIS FISCHER, M. D.

Attending Physician to the Willard Parker and Riverside Hospitals of New York; Attending Pediatrist to Sydenham Hospital; Former Instructor in Diseases of Children, New York Post Graduate School and Hospital.

The diagnosis of lobar pneumonia is easy providing the routine symptoms described in text-books appear regularly. More often an irregular course of symptoms, very misleading at times, is noted. Not infrequently one will find a history of a disordered stomach with a coated tongue and fever, and no symptom giving a clue to the diagnosis.

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*Read in part by invitation before the Eastern Medical Society at a Symposium on Pueumonia.

In the early development of the disease, sometimes during the first forty-eight hours, the pulse-respiration ratio will not be more disturbed than would be found associated with any ordinary febrile disturbance, be it gastric, intestinal, spleenic, hepatic, or cerebral. We must never suspect cough in children to be an indicator of a distinct pulmonary infection, and while children do cough, naso-pharyngeal and tonsillar infection must be excluded before giving weight to the symptom of cough as a factor in framing the diagnosis of pneumonia.

Expectoration. In the lobar type of pneumonia in infancy, we miss that very important aid to the diagnosis found in the adult type of pneumonia—namely—the characteristic expectoration of the rusty type, so-called, prune-juice expectoration. When children cough they immediately swallow instead of expectorating. From the foregoing one can see the great importance of eliminative treatment during the progress of the lobar type of pneumonia. I shall speak of this later on.

Apex Pneumonia. In apical pneumonia we frequently find a series of meningeal symptoms. Not infrequently the disease is ushered in by convulsions. Other children have marked rigidity of the sternocleido mastoid muscles. The head is retracted. There is opisthotonos. Rotation of the head, owing to the rigid muscles of the neck, will be impossible and cause pain. Such meningeal symptoms are due to irritation of the cervical ganglion, and are more probably caused by and due to the effect of the toxin on the cerebral centers.

The differential diagnosis between cerebrospinal meningitis and lobar pneumonia depends on the following signs and symptoms. The absence of the *tache cerebrale* in pneumonia absence of the Kernig symptom; absence of the Babinski reflex. The reaction of the pupils will be normal in pneumonia. Lumbar puncture if performed in pneumonia will give a clear watery fluid; if in cerebrospinal meningitis, the fluid will usually be turbid and contain the diplococcus intracellularis. In some few cases, a clear cerebrospinal fluid, according to Flexner, may also contain the diplococcus intracellularis.

The physical signs in the thorax are usually positive. Bronchial breathing is usually observed along with moist rales and the characteristic subcrepitant rales. Besides this, there is marked bronchophony. There is a marked resistance on percussion in addition to dullness. The breathing is superficial, shallow, and owing to the inflammatory condition of the lung, the accessory respiratory muscles are called into play. The alae nasi show the dyspnoea; and the intercostal spaces if observed, show increased respiratory effort. There is a lack of expansion noticeable in the subclavicular region on the affected side. The early appearance of this sign is very important, in the diagnosis of lobar pneumonia affecting the centre of the lung, before the physical signs derived from auscultation and percussion can be made out. When the physical signs are not positive, but we have a distinct evidence of infection manifested by a drowsy stuporous condition, then the disturbance of the normal pulse-respiration ratio, which normally is one respiration to four pulse beats, or thirty respirations to 100 pulse beats will be noted. If we find 50 to 60 respirations with pulse of 140, 150 and 160, then an active pneumonia should be suspected.

Daily examinations of the thorax must be made in each and every case of suspected pneumonia until the disease is definitely located or excluded. Hypersensitive children, such as rachitic children, usually have temperatures of 105-107 degrees F. This disturbance of the thermic centre, plus the toxemia, is one of the main reasons for the associated initial convulsions or meningeal manifestations. Hyperpyrexia with temperatures of 106-107 degrees F. are not necessarily fatal.

The Blood. The examination of the blood shows marked leucocytosis, and this increasing leucocytosis is a very favorable indication. A leucocytosis therefore of 30,000 to 40,000 or higher shows good resistance, whereas a leucocytosis of 10,000 or 20,000 during the height of the febrile process is a grave sign showing poor resistance.

In this type of pheumonia we have an increase of the polynuclear cells, which rise sometimes as high as 90 per cent. Normally the polynuclear percentage is rarely above 50 per cent. in children. Eosinophiles disappear during an attack of pneumonia.

Abdominal Distention. Abdominal distention is frequently found in pneumonia. It is a very distressing symptom. Pain in the abdomen is usually described in older children as occurring in the right inguinal region, if pleurisy or consolidation of the right lower lobe exists. A rule, therefore, is to examine the lung carefully so as to exclude pneumonia in a case pointing to a *probable but not positive appendicitis*. Intestinal paralysis due to the pneumococcaemia is a frequent cause of persistent abdominal distention.

This abdominal distention is frequently a very grave sign, because in addition to the disturbance of respiration caused by the inflammatory process and the choking of the various bronchial ramifications with mucus and fibrin, necessarily interferes with proper oxygenation of the lung. In addition thereto, when the abdomen is distended there is marked pressure on the diaphragm which is an additional impediment to respiration. This mechanical obstruction can sometimes be relieved by using turpentine stupes over the abdomen, and if this is not sufficient, then one high colonic flushing with one teaspoonful of oxgall and one pint of luke warm water will bring away large quantities of gas and faeces, and relieve the distention When such distention persists it may be neccssary to leave a soft flexible rectal tube in the colon, about ten inches from the anus to drain the accumulated flatus.

Persistent Fever. After an apparent crisis during an acute attack of lobar pneumonia extending over seven to ten days, the temperature, if it has been normal and again rises, demands careful investigation. It is well to remember that in lobar pneumonia we frequently have an extension of the process from lobe to lobe, after an apparent crisis, thus we speak of a migratory or wandering type of pneumonia. In reality a new process from beginning to end. After a first crisis in pneumonia, if the temperature rises and falls and we have an intermitting or a remitting type of fever, then the lungs must be carefully auscultated and percussed with the idea of locating the presence of an effusion. One of the most frequent results of fever following a lobar pneumonia is the migrating of the pneumococcus, and the infection results in a serous on seropurulent effusion. Many of these cases terminate favorably and the fluid is absorbed but many more cases terminate in suppuration and thus we have an empyema. Emphysema can be caused by puncturing the lung. This new complication permitting entrance of air will distend the thorax on the affected side interfering with respiration and not always without serious result.

Signs of Fluid: The early signs of fluid are diminished respiratory murmur, marked dullness and resistance on percussion. This percussion note changes when the position of the child is changed. An aspirating needle should be boiled and the skin over the suspected area thoroughly washed with soap and water, and then pure alcohol. The needle should then be inserted about three-fourths of an inch unless the child is greatly emaciated, and the fluid if present withdrawn. Care should be taken that we enter the pleural cavity and do not puncture the lung. A puncture properly done does no harm even if no fluid is present. If serous fluid is present we can stimulate absorption by aspirating a small quantity of the fluid. It is important to examine microscopically and determine the presence or absence of pus, and unless pus is present an operation is contraindicated.

General Complications. If after the crisis in pneumonia, fever recurs and the lungs can be excluded as the cause of the fever, then the following organs should be suspected: first, the ears require daily inspection. We must not forget that the pneumococcus or influenza bacillus if harbored in the throat from a pneumonia can migrate into the Eustachean tubes thus setting up an otitis media. The proper treatment of bulging of the drum consists in doing a paracentesis. This will frequently cause a drop in the temperature, besides relieving all symptoms of pain if they were present. If an infection of the middle ear is overlooked then we must not be surprised to find sudden mastoid symptoms develop, and sinus thrombosis and meningitis be the result of such neglect. What has been said concerning the ear applies with equal force to the examination of the urine if possible. In very young children it is almost impossible to procure a specimen of urine for examination but we can even in very young infants note the frequency even though we cannot measure the total quantity passed in twenty-four hours. When it is very vital because of persistent vomiting, or an oedema of the extremities to procure a specimen of urine from an infant, then with the aid of a sterile glass or rubber catheter we can draw off from a very young infant, if we will watch for our opportunity at least several ounces for an examination.

Auto intoxication due to Improper Feeding is another cause of fever following the crisis of lobar pneumonia. It happens very easily because a child having been literally starved during the febrile process suddenly regains its normal functions and having a voracious appetite eats more than it can properly digest. In an older child an examination of the urine for indican will quickly settle the diagnosis, but in very young infants one must rely on the physical examination and the history of the case as an aid to the diagnosis.

THE AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSION

The Fourth Annual Meeting of The American Association of Medical Milk Commission was held at the St. James Hotel, St. Louis, Mo., on Monday, June 6. 1910. The three sessions will begin at 10 A. M., 2:30 and 8:30 P. M.

The program committee did good work. Dr. M. P. Ravenel, of the University of Wisconsin; Prof. W. A. Stocking, Jr., of Cornell University; Commissioner R. A. Pearson, Albany, N. Y.; Assistant Surgeon-General Kerr, Washington; Dr. E. C. Schroeder, United States Department of Argiculture; Dr. Henry L. Coit, Newark, N. J.; Dr. Collins H. Johnston, Grand Rapids, Mich. contributed valuable papers.

Among the subjects of greatest interest were—"The Essentials Underlying the Production of Clean Milk," "The Bacterial Content of Milk from Cows Continuously Stabled," "The History, Development and Statistics of Milk Charities in the United Utates," "The Advantages, the Limitations and Some of the Results of Milk Charity Work," "The Production of Certified Milk."

SOCIETY TRANSACTIONS

Forty-third Annual Meeting of the Canadian Medical Association.

The annual meeting of the Canadian Medical Association was held in Toronto on June 1, 2, 3 and 4. The scene of the gathering was the University of Toronto, buildings which had been lent to the Association for the occasion and which were admirably adapted to the purpose in every respect. Between three and four hundred members and visitors, most of the visitors being from the United States, reached Toronto by the first of June. The opening meeting took place in the splendid and spacious convocation Hall of the University, the chair being taken by the retiring President, Dr. R. J. Blanchard, Winnipeg, Manitoba. Representatives of the Government of Ontario, the City of Toronto and the University gave addresses of welcome to the Association after which the President-elect, Dr. Adam H. Wright of Toronto was inducted to the chair. The Presidential address was concerned chiefly with the state of the general practitioner, the carriculum of the medical student and with the pretensions of the modern surgeon. Dr. Wright scoffed at the idea that the general practitioner was dying out but deplored the fact that medical education was now so vigorous. He said that the students of today were bolting more and cramming more and observing less, than did those of ten or twenty years ago. There seemed to be little certainty between the teaching of the primary and the final subjects. In the early years the students were not swallowing pure and applied science in masses too big for their assimilative organs; or, in other words were largely memorizing facts without understanding them. Dr. Wright also broke a lance with some of the exponents of modern surgery who he thought were frequently more bent upon exhibiting their own skill than upon imparting knowledge to medical students and general practitioners

The report of the Milk Commission which was appointed by the Association in 1908 to inquire into the Milk supply of Canada and to suggest measures calculated to improve the supply was presented by the Secretary of the Commission, Dr. Charles J. C. O. Hastings of Toronto. The report contained in a volume of thirty-two pages. The addresses of the various speakers and the discussion that followed should be of much interest to readers of Pediatrics, as infant diseases and infant mortality are very largely bound up with the milk supply. In introducing the report Dr. Hastings said that the reason for the existence of the Milk Commission lay in the present lamentably large infant mortality, and he made an eloquent plea for the introduction of preventive measures in order that thousands of young childrens' lives might be saved. Dr. Hastings was an earnest advocate of pasteurization and after pointing out the good results that had followed the Milk Commission's cooperation with the milk dealers of Toronto, said that the Commission resented the statement that pasteurization paid a premium on dirt. The milk presented for pasteurization had to come up to a certain standard.

Pasteurization of Milk

Experiments at the Toronto Hospital for sick children, in which Dr. J. Ross Robertson had caused to be installed at his own expense a complete pasteurizing plant, had shown during the past week, 30, 61, 8 and 60 bacteria per C. C. in the milk after pasteurization.

Dr. Charles E. North of New York City read a paper on a pure milk supply which was mainly a review of the work accomplished by the New York Milk Committee, of which he was a member. He too, strongly advised pasteurization in view of the issues involved. Part of the solution of the problem, he thought lay in taking the dairy business out of the hands of the farmer, who could not be expected to be a dairy expert. He also mentioned a case in which 700 cases of scarlet fever were traced to one raw milk dealer. Dr. North had, for purpose of experiment, injected three hundred Guinea pigs with New York Milk Samples, half of these injected with raw milk had died, one had died injected with commercially pasteurized milk and none injected with properly pasteurized milk had died. Professor A. McGill Dominon made a very good point in explaining how necessary it was to have a specific definition of pasteurized milk.

In order that legislation might be of avail to improve the milk supply. It was essential that scientific and legal definitions were made alike.

Milk Supply vs. Tuberculosis

Veterinary Director General of Canada, J. G. Rutherford drew attention to the fact that any abnormality in the cow as regards her health or diet was liable to give rise to changes in the quantities and properties of milk and so affect those who drank it. He mentioned a number of diets that would cause disturbing influences in the health of those who afterwards drank the milk of the cows partaking of them. He also mentioned various diseases to which the cow was subject, which, when present reduced the milk of the cow affected dangerous as human food. Views as to the transmissibility of Bovine tuberculosis to human beings believed that infested milk is the most important factor in the spread of tuberculosis. Dr. Rutherford is of the opinion, therefore, that if the disease is to be eradicated from the human species, the rational mode of bringing this about is to stamp it out from cattle. According to Dr. Rutherford, tuberculosis should be attacked in the cow and as that was the most common method of its transmission to humanity the stamping out of the disease amongst cattle would remove one of the great sources among human beings. Afterwards when there were no tuberculosis cows the transmission of tuberculosis would cease to be a problem. The sale of milk from cows not known to be free from tuberculosis was a crime against society and any community that permitted the sale was an accessory to the crime. "What then," Dr. Rutherford went on to say "must be said about communities that continue to authorize the sale of milk from cows not known to be free from disease."

Dr. P. C. Fagin of British Columbia told of what good results were following from their system of dairy inspection and that on account of the tuberculin test the percentage of effective stock was on the increase. Dr. Fraser, of Toronto suggested that a much shorter time should be taken in getting the milk from the cow to the coustomer.

Dr. H. A. Evans, the Commissioner of Health of Chicago should have read a paper but was unable to be present. The symposium and discussion were highly instructive and the significant feature of these was the faith placed in the pasteurization of milk as a safeguard against the conveyance of disease thereby.

Chronic Diffuse Parenchymotous Nephritis.

The address in Medicine was given by Dr. W. P. Heringham, of St. Bartholomew's Hospital, London, England, the subject being chronic diffuse parenchymatous nephritis. This disease is one that does not especially select the young for attack, in fact, it can hardly be termed a disease of childhood. Dr. Heringham said that acute nephritis was extremely rare in England but that out of 6 cases he had met with, two occurred in boys, one of which was the side case of primary nephritis due to exposure he had ever encountered. With regard to the high blood pressure the usual concomitant of Bright's Disease, Dr. Heringham said that he looked upon this more in the light of compensatory action than as a symptom. He further said he did not regard high blood pressure as serious in the young, whose arteries were elastic and could withstand much pressure. In the old, however, whose arteries were frail and brittle it was serious.

Dr. John B. Murphy of Chicago delivered a brilliant address in surgery, taking as his subject injuries of joints. Dr. Henry C. Coe, of New York gave a conservative and common sense address in gynecology.

Exophthalmic Goitre.

One of the most important features of the meeting was a symposium on Exophthalmic Goitre, in which Dr. Alex McPhedran of Toronto discussed the disease from the medical aspect. Dr. F. Shepperd of Montreal from the surgical aspect and Dr. S. P. Beebe from the pathological aspect.

Dr. J. C. Connell of Kingston, Ont., in a paper comparing the curricula of Canadian Universities twenty-five years ago and at the present time, proposed the appointment of a committee of the Association to deal with the subject of medical education. In response to his plea a committee was appointed.

Appendicitis in Children.

The program of the Sections was long and very few papers were read on the diseases of children. In fact, there was only one paper, in the one meeting of the Section of Pediatrics, which was held in conjunction with the section of obstetrics and gynecology. The paper was by Dr. Joseph S. Graham of Toronto and dealt with pericarditis in in children. The most widely debated paper on children's diseases was that by Dr. I. Wood, of Kingston, Ont., treating of appendicitis in children. (Published in this issue.) Dr. Wood argued, in which argument he is supported by Kelby, that appendicitis in children is much more difficult to diagnose than in adults and is consequently more frequently overlooked at any rate in the early stages. Moreover Dr. Wood showed by statistics that the mortality rate amongst children is very considerably higher than among grown up persons.

Dr. Shepherd of Montreal, however, did not think that diagnosis was more difficult among children. Dr. Primrose, of Toronto, said that the absence from the diseased appendix was more common in children.

Diseased Tonsils.

In the Section of Eye, Ear, Nose and Throat and interesting discussion took place in regard to diseased tonsils. Dr. W. P. Caven dealt with the effect of diseased tonsils upon the general system. He considered diseased tonsils one of the most important factors of infection. That diseased tonsil removed in time would do away with tuberculous glands. That articular rheumatism often follows diseased tonsils which may be the part of entry of rheumatic infection. The coincidence or sequence of diseased tonsils and articular rheumatism was at least striking. Dr. Caven thought that diseased tonsil had a considerable bearing on the occurrence of other diseases among these appendicitis.

The debate as to the Surgical treatment of this condition waxed somewhat warm. Dr. Price Brown, of Toronto, did not hold with entire removal of the tonsil, for the reason that it had functions in early life—up to adult age, he thought it to be wiser to partially remove the diseased tonsil, but in adult life to totally remove it. He further said that German and English, as well as the chief European authories did not remove the tonsil completely, until adult age was reached and that it was only the

American operators who did the radical operation at all ages. Several took the view that enucleation of the tonsil was indicated at all ages in case of disease.

Cause and Treatment of Psycho-neuroses.

The most prominent feature of the meeting was a symposium on the psycho-neuroses in which some very distinguished men took part. Dr. J. J. Putnam of Boston, who is a pupil and follower of Professor Sigmund Freud of Vienna, both as to the theory of causation and treatment of psycho-neuroses read a paper on psycho-analysis. Freud's method of treatment comprises appropriate application of remedies to quiet sexual excitement Dr. August Hoch, of New York, read a paper on the same subject. Dr. W. M. Hattie, of Halifax, read a paper on the psycho-neuroses in asylum practice and Dr. Ernest Jones, of Toronto, read a paper on their general significance. In the discussion that followed, D. Joseph Collins, of New York, was the only one to antagonize Freud's theory and practice and he did so on the ground that his interpertation of psycho-neuroses was too arbitrary and that, considering this his theory was not proven and that his treatment had not been followed by fruitful results, the claims of himself and followers were exaggerated. Dr. Collins read a paper in the Section of Medicine on June 2nd, in which he set forth his views at length, bringing forward much convincing evidence in support of his statements.

The basis of Freud's theory is that all psycho-neuroses have their origin in sexual life and that even the hysteria of childhood is caused by some sexual expression.

The Medical Inspection of Schools.

Amongst the general business done by the Association was the consideration of a report advocating the adoption of a system of medical inspection in all the schools of Canada presented by Dr. John Stewart of Halifax. The result was that a special committee was appointed to look into the question. The recommendations of the report are as follows: That the boards of education, the Minister of Education or Council of Education shall appoint a public inspector, and that each province shall have an expert medical adviser, who shall organize a complete system of medical inspection, for the supervision of schools and school children. The council of the Association recommended that the Association shall bring out a journal forthwith, with Dr. MacPhail of Montreal, as editor, and further recommended that the Association Journal should absorb the Montreal Medical Journal. The recommendation was adopted. Dr. T. G. Roddick, of Montreal, brought forth an amended bill on Dominion regristration asking that the Associstion accede to its various clauses. The changes were accepted with amendations.

The following officers were elected for the coming year, President, Dr. George E. Armstrong, Montreal; General Secretary, Dr. E. W. Archibald, Montreal; Treasurer, H. B. Small Ottowa. Votes of thanks were given to Dr. George Elliott of Toronto, the retiring Secretary.

PHILADELPHIA PEDIATRIC SOCIETY

The Cutaneous Diagnosis of Tuberculosis.—Dr. Clemens Freiherr von Pirquet, of John Hopkins' University, Baltimore, Md., delivered this address, by invitation, before the Philadelphia Pediatric Society, at a stated meeting, February the 8th, 1910. After giving a brief history of the diagnostic use of tuberculin and the theories as to its action, Dr. von Pirquet explained the basis of the cutaneous reaction. As in a revaccination, an inflammatory reaction of the skin appears only in those individuals who have already been infected, who have, therefore, formed anti-bodies. The tuberculin test is a test of the existence of anti-bodies, its positive issue showing that the organism has had a tuberculosis. A negative issue, in spite of an existing tuberculosis, is seen in several instances, as in the last stages of tuberculosis and during measles. The value of the cutaneous test was discussed on the basis of 328 post-mortem examinations upon children who had undergone it. Practically it should be tried as a matter of routine upon all children taken into a hospital; besides, upon those children only whose symptoms suggest a possible tuberculosis; finally, as a matter of preventive medicine, in orphan asylums, to separate the infected, and keep the remainder aloof from every possibility of infection.

Dr. John Howland, of New York, who discussed the paper by invitation, said: As the result of Dr. von Pirquet's observations, controlled by autopsies and confirmed by numerous workers in all countries, we may assume that the cutaneous test is of the greatest sensitiveness and accuracy. It is true that occasionally it fails in the last stages of tuberculosis and in measles, but in the former of these conditions any treatment is valueless, and only the satisfaction of an accurate diagnosis is affected; and as far as the latter is concerned, one would hardly apply the test during an acute attack of measles. In addition to its sensitiveness and accuracy, the test is the easiest of all biological tests to apply, meets with no opposition, and is almost always readily interpreted. It carries with it also not the least element of risk. With its many advantages and its absence of disadvantages, it seems to me that the benefits that we derive from the von Pirquet reaction can be grouped under four headings. First, the assistance in diagnosis in single patients. Should a positive reaction be obtained, it does not, of course, necessarily mean that the symptoms for which we seek a cause are to be referred to the tuberculosis, but it compels a consideration of this as a possible factor. It may increase our difficulties by increasing our knowledge, and it does this in direct proportion to the age of the child, for the older he is, the more liable is he to react. In children under a year a positive reaction must be considered of the gravest import, as at this tender age the tuberculous process is practically never latent. It is not necessary for me to dwell on the use of the reaction in individuals, or to answer the complaints of those who have criticised it because they were led to believe a condition tuberculous as the result of a cutaneous test which was in reality not so. It would be too much to expect any biological test to show the difference between an active and a latent lesion. For obvious reasons the test is chiefly one for children. In the younger of these it is the positive test that is of value; in the older it is the negative test that is of assistance. The ease of making the test and its accuracy give us the second benefit, a broader and more general knowledge in regard to the frequency of infection at the different ages than could be obtained in any other way. It shows more clearly than clinical and pathological studies could do the frequency of infection at the various ages and the almost universal infection of adults—surely knowledge of the greatest importance. We have employed the test regularly in the children's wards at Bellevue for more than a year; it is just as much a part of the routine as taking the history. The third benefit is in institutions and asylums, where, on the basis of the cutaneous test, we may segregate the tuberculous and thus institute special treatment for them as well as protect the non-tuberculous. Those who have worked in asylums know what a veritable boon this is. The fourth benefit is in regard to the children of the tuberculous to recognise those that are infected and treat them in order to prevent, if possible, spreading of the process. In the tuberculosis department of Bellevue this plan has been followed for some time with very interesting and satisfactory results. All adults applying for treatment are requested to bring their children with them at a subsequent visit. All the children are tested, and those not reacting are kept at home if the hygiene of the home be good. Those reacting are examined physically to see if there is any active lesion, and if there is they are immediately placed under treatment in sanatoria or day camps. If there are no signs of an active process they are carefully watched, put in the best surroundings possible, and weighed from time to time. If they fail to gain weight they are considered active cases and treated as such. By virtue of this test, then, we are assisted in diagnosis, obtain a wider knowledge of the disease in general, protect individuals, and treat sufferers from the disease more intelligently and earlier than could otherwise be done. Finally, while the benefit to us remains the same, the credit to Dr. von Pirquet is far greater in that the test was developed, not as the result of a chance observation, but from the basis of sound logical reasoning.

Editor of Pediatrics:—

It is now thirty years since I commenced to treat summer diarrheas of all grades with zinc sulphocarbolate. With a chemically pure salt success is sure if applied wisely. Empty the bowel of its decomposing contents, and give 1-6 of a grain every hour until the stools become natural. Diet judiciously and see that the child has only pure air to breath. Frankly, I do not see how any case can be lost under this treatment.

WILLIAM FRANCIS WAUGH, M. D.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

EDITED BY

KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic, Mt. Sinai Hospital, New York City.

Researches on the Diarrhea of Infants (*Gaz. Med. de Paris, British Journal Diseases of Children*).—E. Metchnikoff has studied the intestinal flora in acute gastro-enteritis of infants, which he finds much less complex than in adults. This flora, which plays an important part in the physiological phenomena of nutrition, has a serious bearing not only in affections of the digestive track, but also in disturbances of nutritive metabolism, and in diseases of the nervous system, skin and kidneys. Experiments which resulted in causing diarrhea in young rabbits at the breast by administering portions of the stools of infants suffering from acute gastro-enteritis, prove that this latter is an infectious malady. Experiments on chimpanzees gave analogous results, the influence of food and high temperature being excluded. The author at first thought that the infective agent was to be found in paratyphoid bacilli, but soon became struck with the constant abundance of *bacillus proteus*, occurring in thirty cases out of forty. It developed readily on gelatin. The experiments were then repeated by administering to the rabbits and chimpanzees pure cultures of *proteus*: the resulting infection, instead of showing itself as diarrhea, took the form of a fatal dry cholera. Assuming that *proteus* plays an important part in infantile diarrhea, a search for the source of the infection disclosed the fact that it was rarely met with in cow's milk. On the other hand, house dust and faecal matter from a number of animals contained it, and it is found on the outer layer of most food-stuffs, including cheese, grapes, and salad. The author concludes that the micro-organism is transported by flies from the dejecta of animals to the articles of diet which are consumed raw, and thus introduced into the digestive track of persons who eat them. Prolonged contact of these persons with nurslings is sufficient to contaminate them with the microbe, which, though well tolerated by adults, provokes diarrhea in infants. Hence the means taken with regard to milk by sterilization, etc., are not sufficient, but attention must be directed to keeping the hands clean, washing certain food-stuffs, purifying the streets, and destroying flies.

Urticaria in Infants.—Infantile urticaria is essentially a chronic disease unlike that of adults, by no means uncommon, limited to children under five years of age, by far the most common during the second year, and productive of much suffering. The usual cause is an error in diet, in the case of breast-ted infant, in the mother, or too much clothing, according to Dr. Udo J. Wile, New York (*American Medicine*, January, 1910).

When the vaso-motor balance is already disturbed very simple external causes may provoke an outbreak, such as bites of insects, scabbies, etc. The most frequent complications arise from scratching and infection in neglected cases.

Clinically it is characterized, first, by an intense pruritus, as evidenced by scratch marks; secondly, by loss of sleep and night crying, and thirdly by a polymorphous eruption. The latter consists of wheals, deep-seated papules, excoriated papules, vesicles and at times even bullae and pustules may be present. The extremities are more frequently attacked than the body, the face and head seldom. The soles and palms are very frequent sites of papules and bullae, but rarely of wheals. The wheals when first seen are quite different from those of ordinary acute urticaria in adults.

Treat the patient and not the disease, applies here as in no other condition. One is not dealing with the direct effect on the skin, of an intestinal disorder. The first thing therefore to be looked into is the diet of the infants, not forgetting in case of a nursing infant to probe carefully into the diet of the mother, and equally important, the regulation of the number and time of the feeding per diem. Too often the children are overnursed, and indeed many look overfed, too plump as it were. Secondly, in an infant suffering with urticaria insist on, as nearly as possible, an aseptic condition of the finger nails, and so avoid distressing suppurative complications; thirdly, insist on the avoidance of too much clothing in the children, especially in the summer; this point is of particular importance.

Drugs are of minor importance. Alkaline (washing soda) baths and antiseptic or cooling salves are most frequently indicated. The child should remain in the bath at least fifteen minutes. White precipitate ointment is preferred and when the itching is intense the baths are to be followed by a lotion or ointment of carbolic acid, menthol or calamine.

Congenital Word-Blindness.—Mr. Herbert Fisher, in a paper on inability to learn to read, reported (*British Journal Diseases of Children,*) four cases which had come under his own observation in one girl and three boys. In one of the male cases there appeared to be very suggestive evidence of a hereditary and family tendency to the defect, in another there had been considerable flattening of the left side of the cranium at birth, and a remnant of this deformity could still be easily recognized. The author thought it probable that as further examples of the defect were collected, the cases would be found to range themselves into two groups: (*a*) The hereditary group, in which the visual memory center for words residing in the left angular gyrus failed in development; probably in this group a considerable portion of the female cases would be found. (*b*) A group due to limited meningeal hemorrhage over the same gyrus, the result of birth injury. This group would account for the well-recognized great preponderance of congenital word blindness in the male sex, due to the greater size of the head in male than in female infants at birth. He pointed out that larger meningeal hemorrhages at the time of parturition, resulting in birth palsies, were twice as common in male as in female children. He urged the necessity for special and private tuition for children with this defect of congenital word-blindness, and he thought the phonic method of learning to read, making use of the glosso-kinesthetic center to aid the visual memory center, less likely to lead to a satisfactory result than endeavors to train a vicarious visual memory center in the right hemisphere. For such training he advocated the "look and say" method of learning to read: the child should use the "word" as its unit of observation and study and not the individual letters. The "look and say' system had been practically developed by Miss Mason, of 56, Romola Road, Herne Hill, S. E., in her "Delightful Reading Box" system, which the speaker had had used with most satisfactory results in one of the cases reported to the meetimg.

The Prophylaxis of Acute Anterior Poliomyelitis.—Romer and Joseph in *Munchener Medizinische Wochenschrift,* May 3, 1910, say that in discussing the prophylaxis of such a disease as poliomyelitis one must consider two forms of prophylaxis, hygienic and medicinal, especially etiologically specific treatment. The latter may be preventive or curative. In hygienic prophylaxis domestic animals, as dogs and chickens, must be considered as possible carriers. Another point of importance is the probable part played by human beings as disseminators of the disease. In many ways the mode of transmission seems to be similar to that of meningitis. It has been suggested that the virus is present in the nasal and pharyngeal secretions, both of these suffering from the disease in its abortive or complete form and in the clinically healthy. Contact with secretions from such persons may cause infection. Experiments have shown that virus remains virulent, and apparently actively virulent, after 28 days of drying. It may, therefore, be transmitted through dust. The authors have exposed the virus to fumes of formaldehyde in a room by the usual disinfection methods, and have shown that after seven and a half hours the virus, when injected into a monkey, was inert; that the usual formaldehyde disinfection destroyed the virus. It is urged that disinfection should be carried out in a room which has held a patient. Careful disinfection of the nose and mouth of patients and all exposed to them is advised to prevent the danger of carriers. The discovery that one attack renders an animal immune to a second infection, and that the serum of an immune animal protects a normal one, holds out hope for the production of an immunizing serum.

The Transmission of Typhoid Fever by an Infant.—Rommeler reports in *Munchener Medizinische Wochenschrift*, May 3, 1910, the case of a woman, aged 26, who, while nursing her infant, developed typhoid fever. The mother was admitted to a hospital and the baby was sent to be cared for by a friend. The child had a slight attack of diarrhea, but otherwise appeared quite well. Two weeks later the woman who was caring for the child developed typhoid fever and was soon followed by her three children, a three-year old niece, and a twenty year old servant. The child was then examined, and was found to give a positive Widal reaction, and on one occasion typhoid bacilli were isolated from the stools. The author draws from this case the lesson that when a nursing mother developes typhoid fever her infant should also be taken into the hospital. The symptoms of a typhoid infection in an infant are so slight that there is a great danger of a child apparently quite well conveying the disease to others.

The Effect of Atropin on the Excretion of Sugar in Diabetes Mellitus in Children and Adults.—Of the drugs which are safely and advisedly used in the treatment of diabetes for specific effects, sodium bicarbonate for the alkalies and codeia for the opiates have stood as prototypes. Rudisch (*Jama*, LIII, page 1336) reports some marked examples of the effect of atropin on excretion of sugar in three cases of diabetes in children nine, eleven and fourteen years old respectively. The author states that "it is often possible to suppress sugar secretion solely by atropin without reducing the carbohydrates." The sulphate and the methylbromide of atropin are in greatest favor. The latter is said to have the advantage of being less toxic and the disadvantage of being expensive. The sulphate is given to children in the dose of one-hundred fiftieth grain ter in die. The author has given one-tenth grain daily to children and one-sixth grain to adults without harmful results. When atropin is withheld the percentage of sugar rapidly increases, to fall again when resumed.

Doctor Jacobi has probably had the largest experience with the use of belladonna. In pertussis the dose for the child is that number of drops which produces the physiologic effect. In this disease the remedy has been used for indefinite periods of time without any apparent harmful effects. This would seem to argue in favor of at least further trial of atropia in diabetes mellitus. Drugs should always be given guardedly in this disease. The liability of habit is not great with atropia.—*The Physician and Surgeon.*

Mitral Stenosis in Children.—The results in this paper have been arrived at by an examination of the post-mortem records of a sick children's hospital extending over twenty-three years. The following is a brief abstract of the paper: One of the most striking facts is the comparative paucity of cases of mitral stenosis, for there were only 30 out of 1182 necropsies which showed definite stenosis of the mitral valve.

Mitral stenosis is very rarely seen alone in children; when present it is complicated in 96 per cent. of cases by other cardiac lesions, the commonest of which are pericarditis and mitral regurditation.

From the point of view of morbid anatomy in children the button-hole variety is extremely rare. Twice as many females as males are attacked, and the determining cause in the majority of cases was either rheumatism or chorea. The greatest number of deaths occurred between the sixth and tenth year.

Edema of the lungs is less common than either edema of the body or ascites, although this is perhaps not so much dependent upon the condition of stenosis of the mitral valve as upon concomitant cardiac lesions. The commonest cardiac sign of mitral stenosis is in connection with presystole, either in the form of a murmur or a thrill. The systolic murmur is the next most common, whilst the diastolic murmur must be considered as a sign of a complicating lesion.

In nine out of thirty, or nearly one-third, the condition of the heart was not diagnosed correctly (*Med. Chronicle,* February, 1910).

Urinary Stones in Children.—Kingman Page, summarizing recent literature in Archives of Diagnosis, concludes that the diagnosis of vesical stone is much more readily made than that of renal concretion. Pain, often excessive after urination, stoppage of the urinary flow, blood alone or together with pus in the urine if infection has occurred, penile pain at the glands leading to the pulling on foreskin or squeezing of penis, pains on jarring exercise or riding in a vehicle, and the relief of pain and urinary irritation in the recumbent form so striking a symptom-complex that attention is at once drawn to the seat and cause of the trouble. Freyer gives a most graphic description of the actions of the juvenile victim of this condition.

The improvement in the technic of radiography and the modification and adaption of cystoscopes of small caliber have greatly aided in the recognition of renal calculus. In the determination of the minute concretions of infancy the X-ray is of no help. In the larger stones of older children, with proper attention and care, a good radiogram can generally be obtained and the stone demonstrated, especially if the radiograms be taken, both directly and stereoscopically. Under certain circumstances, however, they may fail to cast a shadow, and the diagnosis must be made by a careful study of the syndrome. In the main, however, the X-ray is more reliable than in the adult.

Prophylaxis of Scarlatina and Measles.—Milne, of London, recommends a weak solution of oil of eucalyptus to the surface of the patient's body, until the fifth day, as often as each hour; later, once or twice a day will be sufficient. This solution should not be stronger than ten per cent, but may be three per.cent. or five per cent. For measles the same treatment is as efficacious in preventing the spread of the ailment. He suggests a mild phenol lotion for the nose and fauces, from which additional danger may be met.

In certain patients, very sensitive in the skin tissues, the oil of eucalyptus might excite idiosyncratic reactions, and the use of phenol, in sufficient strength to disinfect the nasal and oral cavities, might be toxic. Nevertheless, such reactions are not common. The need of restricting the spread of so baneful a disease as scarlet fever requires no argument. People say, How is it, in the heart of virgin country, as in the back woods of Australia, or on the plains of the West, in our own country, children develop measles? In what mode does the case originate? Can we trace it by letters or packages? Undoubted cases of the transmission of scarlet fever by clothing long put away in trunks, or boxed up, are on record. The value of the oil of eucalyptus, if it can be depended on, is chiefly in the destruction of the pathologic excreta at once.

Thirst Fever in Infants.—Variations in the temperature of the young infant, as the result of the most insignificant causes, are common occurrences. What in an adult would be a hardly noticeable gastro-intestinal disturbance is capable in the baby of producing a temperature as high as 104 or 105 degrees. A troublesome tooth about which there is but slight congestion may well cause a fever sufficiently high to result in a panic in the mind of the watchful mother and in a hurried call for the physician. A child, too, apparently desperately ill with hyperpyrexia may be seen four hours after a thorough catharsis playing happily in its cot. Recently the German pediatrists have called attention to another cause of sudden fever in the infant, the so-called "salt fever," produced by subcutaneous or rectal injection of saline solution, in which a few hours later the temperature rises rapidly, remains so for a few hours, and then as rapidly falls. In the *Berliner klinische Wochenschrift* for April 11, 1910, Erich Muller reports two cases of a condition first described by Crandall in 1899, but as yet not widely appreciated, which is closely related to the "salt fever," but is due to concentration of tissue salts, not by the administration of salt, but by withholding of water. In his cases, a few hours after withdrawing the child's food, for one reason or another, a rapid pyrexia appeared, lasting until either milk or some other fluid was given. First considered to be cases of fever from hunger, they were soon shown to be prevented if the milk was replaced by weak tea, and it was conclusively proven that the important factor in causing the fever was thirst. The possibility of such cases of "thirst fever" should be borne in mind by the physician when ordering starvation in the gastro-intestinal affections of childhood, or when suddenly confronted with an inexplicable case of fever in the young infant.

Decayed Teeth in School Children.—Dr. W. R. Woodbury states (*The Boston Medical and Surgical Journal* of Jan. 27, 1910), that the most common physical defect in school children is decayed teeth; of 600,000 children examined in New York City nearly 65 per cent. were found to be dental cripples. Only eight per cent. of the community, in Dr. Woodbury's opinion, care properly for their teeth. In children especially dental caries furnishes lodgment for the germs of diphtheria, scarlet fever, pneumonia, etc. The well may thus also be carriers and potential spreaders of epidemics.

Inguinal Hernia in the New-born (La Path. Enfant, November 15, 1908).—Broca finds that children who are the subject of retarded physical development present predisposing conditions to hernia. Chief among the causes are rickets, malformation of the peritoneum, and prematurity; also heredity, especially on the father's side. In many cases the hernia is present at birth and it frequently contains the large intestine, a peculiarity which is common to infancy and old age. In many cases the hernia appears later, being produced by the mechanical effort of coughing, crying, etc. In a large number of cases the cure is spontaneous or is brought about by the use of an ordinary supporting bandage. In ill-nourished and rickety children, however, there is but little tendency to spontaneous cure, and the condition may even become aggravated, the restlessness and cryings increasing the hernia, which is in itself a cause of colic and discomfort. The involved intestine often becomes the site of impacted feces and strangulation under one year of age is not uncommon. During the second year Broca advocates the performance of a radical operation, which gives very good results.

BOOK REVIEW

Diseases of the Heart. By James MacKenzie, M. D., M. R. C. P. Second edition, revised and enlarged, 376 pages. Cloth $5.50. Oxford University Press, (American Branch), 35 West 32nd Street, New York City, 1910.

The opening chapters deal with clear descriptions of the latest investigations concerning the anatomy and physiology of the heart, and considers the influence of the respiratory system and the arterial system upon the functions of this organ. There is also a description of the various forms of modern apparatus which are employed in the study of circulatory states at the present time.

As the nature of the heart affection can only be inferred from the presence of one or more symptoms the author's object has been to ascertain the mechanism by which the symptoms are produced, to find out their relationship to organic changes in the heart, to ascertain their prognostic significance, and finally to employ them as a guide for treatment. The author's experience of a quarter of a century in dealing with diseased conditions of the circulatory apparatus places him in a position to write authoritively on Heart Disease.

The author, when referring to the digital examination of arteries tells us that the trained finger is the best guide that we have to judge the blood-pressure of an artery but not for a moment does Dr. MacKenzie depreciate the value of instrumentation in arriving at exact and scientific diagnosis. A careful consideration of many of the facts presented by Dr. MacKenzie will help physicians very materially in an improved therapeutic application of various drugs which are found to affect the heart.

Probably few physicians know what is meant by "nodal rhythm" and equally few are well enough trained in modern methods to know that this nodal rhythm is present in the majority of cases of severe heart failure, and, in a great many instances, a breakdown is directly attributable to its inception, nodal rhythm being a condition in which the contraction wave arises in the auriculo ventricular node in distinction from sinoauricular node, with the result that incoordination between the auricle and ventricle is established, the ventricle contracting before the auricle. In disease, or distention, of the auricle the passage of the contraction wave from the sinoaricular node may be blocked. So, too, says Dr. MacKenzie "it is important to remember that digitalis may at times produce an artificial heart block; and that it is particularly prone to do this, when such a condition of the auricle as we have just described, is present."

Dr. MacKenzie in this work, besides dealing with and describing abnormal physiological states from an etiological point of view, also considers in great detail, the pointing out of conditions in which many drugs, chiefly digitalis, are now employed in a haphazard manner, which often do more harm than good.

The closing pages are devoted mainly to the theory of cardiac conditions. There can be no doubt that MacKenzie's first edition marked an epoch in the study of cardiac affections, and there can be equally no doubt that the appearance of his second edition in an American reprint will be of the greatest possible benefit to physicians and patients alike upon this side of the water. The many illustrations, the large type, the excellent language, and above all the scientific stand-point of the author cannot fail to interest medical men who desire to be more than mere routine dispensers of powerful drugs.

PEDIATRICS

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EDITORIAL

ACUTE POLIOMYELITIS

(Acute Atrophic or Wasting Paralysis)

The profession of medicine is one of continuous progress and today we learn a fact which tomorrow must be unlearned. The medical profession of today has the task of making and creating a new literature upon the subject of infantile poliomyelitis.

We are publishing in this issue several papers, reviewing several thousand cases and covering various phases of this interesting, but most dreadful malady to infantile life. During the past few years there have occurred several epidemics in various parts of the world, and our own country, the United States, had a little more than one-half of the reported cases. Flexner and Lewis have demonstrated by laboratory experimentation, that it is an acute infection which can be reproduced in certain of the lower animals, particularly in the monkeys and apes. Dr. Flexner states that the experimental disease is not only identical with the disease in human beings, but that the effects are much more intense upon these animals than upon human beings. The virus of this disease, according to Flexner, is excreted through the nasal and pharyngeal mucosa and travels readily from the mucosa of the nose to the meninges.

Our views on acute poliomyelitis have of recent years undergone some modification. It is now known that the inflammatory changes are by no means confined to the anterior cornual cells in the cord, and hence the word "anterior" has been dropped from the title of the disease. It is also recognized that, as a rule, changes are found pathologically extending to a higher level in the central nervous system than the symptoms during life would suggest. Again, many instances have now been recorded in which there was clinical evidence of involvement of the brain, as well as of the spinal cord. It may be considered as settled that the damage done to the nervous tissues is due to inflammatory changes and not, primarily, to an infective thrombosis. The recent work of Flexner and Lewis gives rise to the hope that the causative organism will soon be obtained. From this occasional occurrence in epidemics it cannot be doubted that the disease is caused by a micro-organism, belonging to the class of so-called filterable viruses: of ultra microscopic size so minute that even the most powerful microscope fails to reveal them. Some observers state that the virus of poliomyelitis and the virus of rabies to be very similar in size and much alike in other respects.

As yet there is no specific treatment, nor any intelligent means of prevention. The severity and fatality of poliomyelitis fluctuates widely in different epidemics, and its effects are always so disastrous as to make it of the gravest importance to the profession. It is one of the gravest of infectious diseases and beyond question on the increase. The mortality ranges from 8 to 15 per cent.; of the cases that ultimately survive, more than 80 per cent. are permanently paralyzed and remain cripples for life.

Until the publication of Flexner's and Lewis's researches the cause of the disease was unknown, and even now its exact mode of dissemination has not been discovered nor determined; but it is beyond question an infectious disease.

CHOLERA INFANTUM.

This is fortunately a rare disease, with an intimate clinical association with gastro-enteric infection, so that severe cases of the latter are not always readily distinguishable from the former. Summer diseases, more particularly enterocolitis and acute milk infections appear just as frequently in breast fed children who are carefully managed, as in bottle fed children. Any child is improperly fed that is allowed *too frequent* feedings or is allowed breast milk which is unsuited for the infant, because of excessive fats or an excess of proteids.

The disease usually begins suddenly, with persistent vomiting, high temperature following some preceeding intestinal disorder, from over feeding or too frequent feedings, of foods unsuited to the child's wants and needs. The abrupt onset of the disease is marked by high and gradual rising temperature with pronounced early prostration, followed in a few hours by vomiting and diarrhea. The vomiting usually preceeds the diarrhea by three or four hours, or both may develop simultaneously The vomiting at once empties the stomach content, then serum, mucus and bile follow. This is followed by a watery diarrhea thirty or forty actions in the twenty-four hours, which completely drains the little body of all watery fluids, leaving the little form pallid, pinched and flabby. The eyes are sunken and rapidly become covered with a gathering, glistening film, the anterior fontanelle becomes depressed, extremities cold and corpse-like, general marked depression follows with a temperature of 105 to 107° F.

Cholera infantum in the child is very similar to cholera nostra in the adult and is especially rampant among the children of the poorer classes, and in the majority of cases, is due to insufficient and improper food; over crowding and filthiness; bad or insufficient drainage; long-tubed nursing bottles; teething, excessive heat, etc. On the whole these are the causes to which the complaint is attributed by most observers. The diseases is the result of toxic poisoning from an organism or group of organisms yet to be isolated and described.

No careful observer will at least dispute as to insufficient and improper food being the chief cause, nor that over crowding and filthiness during the heated summer season is a weighty factor in the causation.

The leading authorities on the diarrhea of children agree that cholera infantum never occurs, save in the hot months of summer, at a time when poison-producing germs are most abundantly distributed and since the specific micro-organism of cholera infantum is yet to be discovered, this judgment can hardly be said to be final.

PATENT BABY FOODS.

An echo from the Section in Diseases of Children of the St. Louis Convention by the A. M. A. brings to us a specimen of fatuitous, irresponsible voicings of a speaker before this section, who gave utterance to the sweeping assertion that "patent baby foods" in nine cases out of ten are responsible for deaths in children from bowel diseases during the summer time.

It is hard to believe that a man of sufficient prominence to be a member of this section would allow such a statement to go to the public. Among all the learned professions, none except medicine would father such irresponsible twaddle. If the gentleman in question had desired to express the opinion that 90 per cent. of infant deaths from intestinal diseases are due to breast feeding, why didn't he say so? He might possibly have been getting nearer the truth in that statement; yet even from that view point we would seriously question the correctness of such a statement, but any man who is so careless in his statistics as to charge 90 per cent. of deaths from intestinal disorders to patent baby foods is criminally stupid. It may possibly be that 90 per cent. of babies that die during the heated summer season are fed in whole or in part on patent baby foods, but this is a different statement altogether to the one made by this learned gentleman.

It might not be too far fetched to make a wager that the speaker himself was brought up on one of the artificially prepared infant foods. If he happens to be a man passed 45 we would double the wager that if he has any children they have been brought up on a patent baby food. Such assertions as these to be voiced by a man of presumably scientific habits is assinine and are of no value, either to the profession or to the cause they are presumably trying to advance.

Any intelligent mother, who has successfully fed one or more children on one of the patent baby foods would not only laugh at such a statement but would wonder with amazement at the stupidity of such an erroneous statement.

Every well-informed layman in this period of enlightenment understands that poor sanitary surroundings, enfeebled inheritance, contaminated food are only a few of the thousand and one factors which must be looked upon as a cause of gastro-intestinal disorders in infancy. To indict patent foods for 90 per cent. of deaths from gastro-intestinal disorders during the summer season is just as reasonable as the argument in the early days against the administration of anti-toxin for diptheria; where a child who had been injected rolled off the bed and killed itself, and its death charged to anti-toxin.

THE NOURISHMENT OF CHILDREN.

An obvious physiological consideration underlies the pathology of childhood. In the period of growth the process of nutrition is necessarily more active than when the fabric is stationary; the demand is greater and returns at shorter intervals, and any failure in supply is more immediately and more severely felt.

Hippocrates expressed this fact in a well-known aphorism, to the effect that old persons endure fasting more easily, next adults, young persons not so well, and infants worst of all. Young animals have been shown by experiment to bear starvation worse than older ones; and we are told that at the siege of Paris those who suffered most from want of food were the very young, nursing mothers, the sick and the wounded. At the siege of Lucknow, also where the privations were great, disproportionately great was the mortality among the children. Dr. Johnson said that he had "fasted from the Sunday's dinner to the Tuesday's dinner without any inconvenience." As a child he certainly could not have done this "without any inconvenience." Young children and boys and girls are often insufficiently fed; they want more than their elders, and generally get less. "Send the children to bed and lay the goose to the fire," is a somewhat selfish proverb which indicates the practice of our early English ancestors.

The substantial late meal, formerly called supper, now dinner, is perhaps not exactly suited to childhood; but there should be some substitute for it. The fast from perhaps, a five o'clock tea to the next morning's breakfast is too long. A growing and hungry child may get meat only once a day, while the gouty parent partakes of it three times. The esurient flunkey sometimes has meat five times a day, with accompanying and intermediate beer; how much both would be benefited if each overfed menial were made to relinquish a portion of his meat in favor of some pale-faced child, perhaps an out-patient at the hospital for sick children in this city. The arrangement would be twice blessed, blessing him that gives and him that takes. I have often thought that school-boys are not fed well enough, and that not from want of means, but want of knowledge. Warren Hastings attributed his diminutive stature to this cause; but it is not necessary to go back to the last century for examples of the fault to which I refer. Children in the nursery, beyond the age of infancy, should have a little light food, such as milk, malted milk, or milk in combination with some of the artificial foods, or beef-tea with toast, bread or biscuit just before going to bed. School-boys, or the like, who dine in the middle of the day, ought to have a little meat by way of supper.

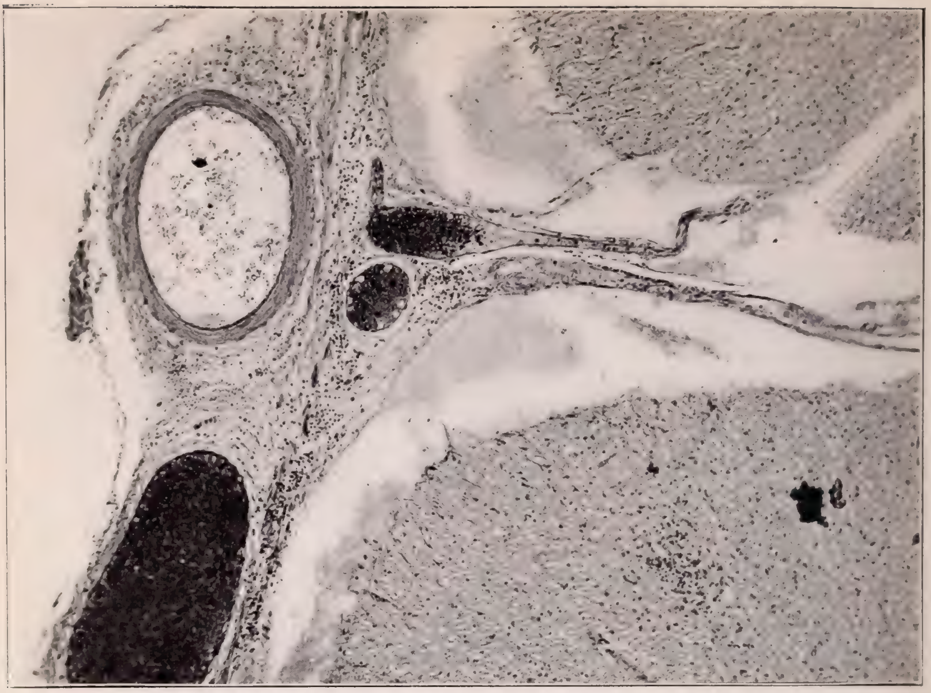

Fig. 1.—First sacral segment showing infiltration of mononuclear cells in the pia mater at the anterior fissure and in the sheath of the vessels.

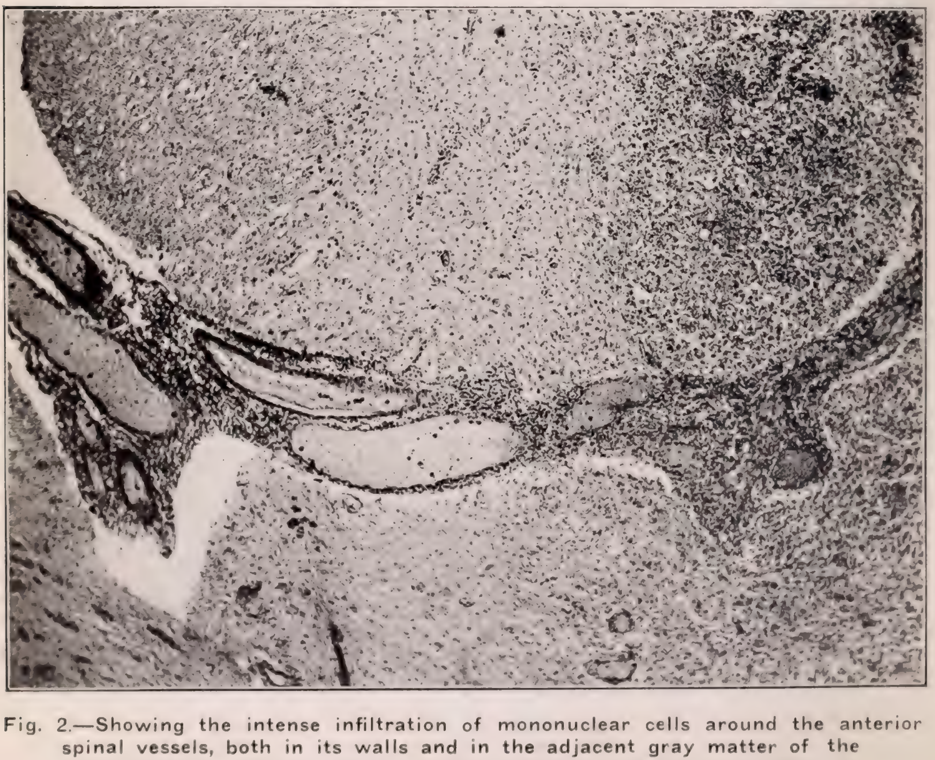

Fig. 2.—Showing the intense infiltration of mononuclear cells around the anterior spinal vessels, both in its walls and in the adjacent gray matter of the anterior horn. This vessel is a continuation of that shown in Fig. 1.

PEDIATRICS

ORIGINAL ARTICLES

THE PATHOLOGY OF ACUTE POLIOMYELITIS*

And Its Bearing upon the Symptoms of the Disease

BY
I. STRAUSS, A. M., M. D.
Instructor in the Anatomy of the Central Nervous System, Cornell Medical College; Associate in Neuro-Pathology, The Mount Sinai Hospital; Visiting Neurologist to Montefiore Home.

The epidemic of acute poliomyelitis which occurred in Sweden and Norway in 1903, afforded Wickman and Harbitz and Scheel the opportunity to make the first thorough studies in the pathology of the disease. The epoch-making inoculation experiments of Landsteiner and Popper in 1909 demonstrated the infectious nature of the disease and opened the way for the valuable studies of Flexner and Lewis, Romer, Leiner and Wiesner, Krause and Meinicke and Levaditti and Landsteiner on the character of the virus and the problem of immunization. The researches of these investigators have taken acute poliomyelitis out of the category of ill-defined diseases of unknown origin. The pathological histology as we know it today differs in many respects from our older conceptions of the diseased processes.

One of the facts now established is that the inflammation of the cord is always accompained by an inflammatory process in the pia mater. This consists in a diffuse mononuclear round cell, probably lymphocytic infiltration, which type of infiltration occurs also in rabies and syphilis, but not usually in diseases of bacterial origin. The meningitis is most marked in the sacral and lumbar regions of the cord and next in the cervical. The reason for this is unknown. The pia over the rest of the cord, the medulla oblongata, pons, cerebellum, and cruracerebri is affected in a lesser degree. Twice we have found a moderate cellular infiltration over the central convolutions of the cerebrum. The meningitis is greatest in intensity on the anterior surfaces of the cord whence it follows the pial process into the depths of the anterior fissure and along the sheaths of the central vessels. It is also continuous with the mononuclear cell infiltration around the other vessels of the cord.

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*Read before the conjoined meeting of the Association of American Orthopedists and Pediatrists, at Washington, May 4, 1910.

The posterior root fibers and the arachnoid membrane covering the spinal ganglia are likewise infiltrated. This infiltration and that of the pia together with the inflammation which is present in the spinal ganglia themselves are the factors which cause the irritative symptoms such as hyperesthesia of various regions of the body,—the rigidity of the neck,—the pain caused by movement of the joints, all of which are present in the early stages of the disease in its epidemic form. Furthermore, it is probable, judging from the early appearance of these symptoms and the efficacy of subdural inoculation in producing experimental poliomyelitis that the virus reaches the meninges very early; yet with possibly one exception (Krause) its presence has not as yet been demonstrated in the human cerebro-spinal fluid. Flexner and Lewis, however have proved its presence in that of monkeys. It is possible that when paralysis, which alone renders the diagnosis of the disease certain, is present the virus has passed entirely out of the spinal fluid and into the cord. It may yet be found in the spinal fluid of one of the so-called abortive cases.

The pathological process in the cord itself is primarily dependent upon vascular changes and secondarily upon changes in the cells, both ganglionic and interstitial. The vessels of the cord, medulla, pons, basal ganglia, and even the cerebral cortex are dilated and engorged and in the cord, medulla and pons the capillaries are distended to more than twice their normal calibre. This hyperemia is found at all levels of the cord irrespective of the intensity of the other inflammatory changes. Arteries and veins are both affected and contrary to the old conception the anterior spinal vein is generally more markedly

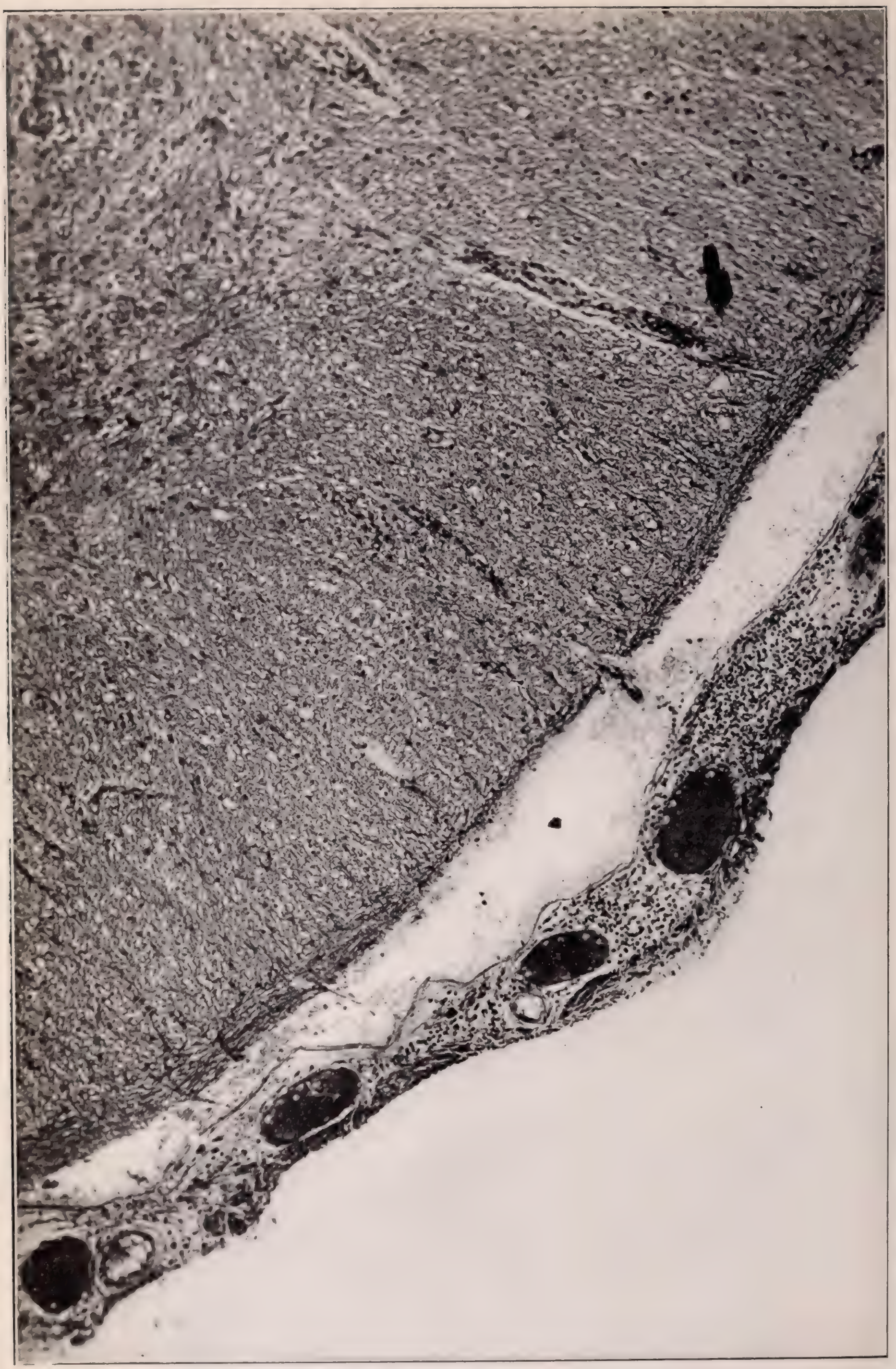

Fig. 3.—First sacral segment showing the intense infiltration of mononuclear cells in the pia mater.

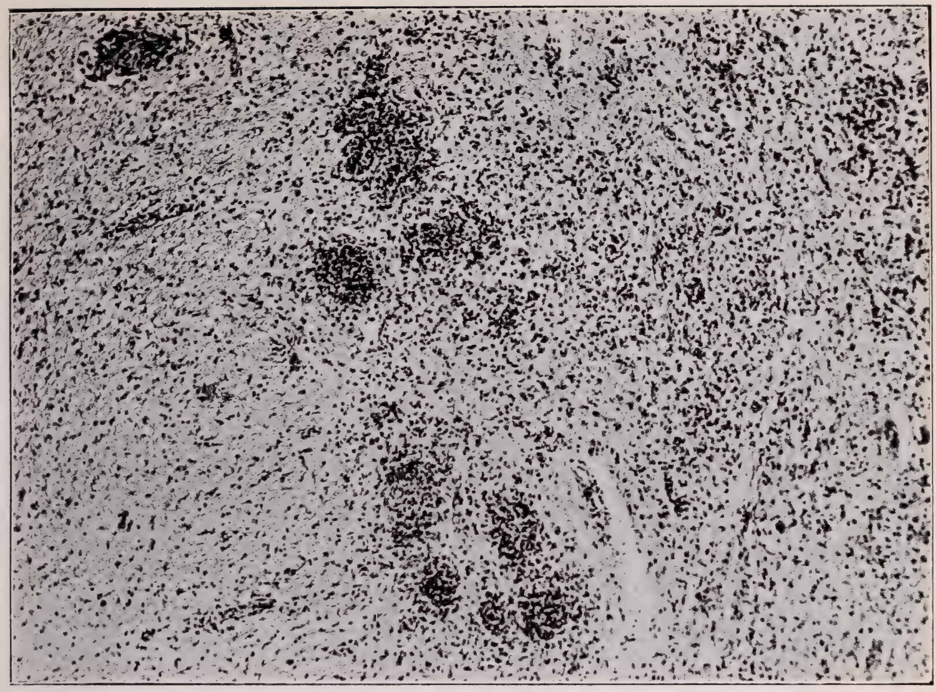

Fig. 4.—Showing a number of foci of polymorphonuclear cells in the anterior horn of the cord.

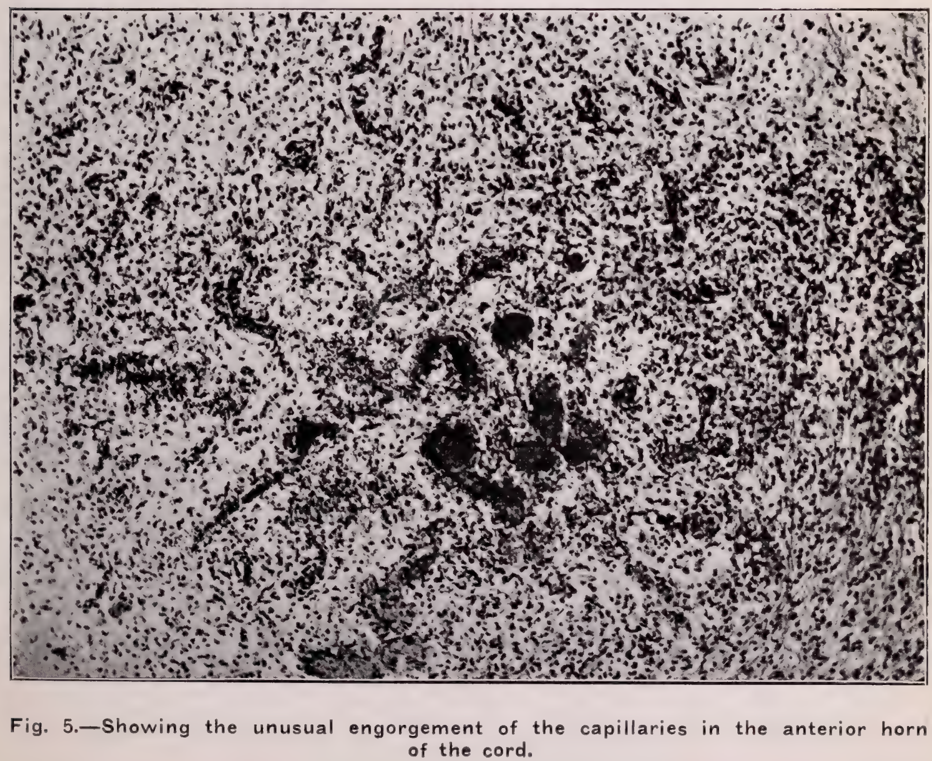

Fig. 5.—Showing the unusual engorgement of the capillaries in the anterior horn of the cord.

congested than the artery. That the vessel walls are affected by the virus is shown by the occurrence of hemorrhages. They are generally in the gray matter of the cord although in one case we found them in the cerebral cortex also. As a rule they are not extensive.

Next in importance to the hyperemia and equally characteristic at times of the inflammatory process in rabies and to a lesser degree in syphilis, is the so-called perivascular, or better, named intra-adventitial infiltration. It consists of collections of small mononuclear round cells which lie in the adventitial lymph spaces. It has not been determined whether the cells are lymphocytes or are derived from the fixed cells of the adventitia. They are not plasma cells. Capillaries showing this adventitial infiltration can be found throughout the entire length of the cord, the pons, medulla, and basal ganglia. We have never seen this infiltration around the vessels of the cerebral cortex. The occurrence of adventitial infiltration does not necessarily mean a disturbance in the function of the part supplied by such vessels. For example, we have noted very marked infiltration in the capillaries in the neighborhood of the third and fourth cranial nerve nuclei without there being any impairment in the function of the muscles supplied by them. In another case in which the clinical picture was that of bulbar paralysis and the extremities were not paralyzed, the vessels of the entire cord were nevertheless the seat of well marked adventitial infiltration. The cells emigrate out into the surrounding tissue, and probably act as phagocytes. The inflammatory edema which is present throughout the entire central nervous system is especially prominent in the white as well as the gray matter of the cord. Its presence can be noted macroscopically by the excessive moistness of the cut surface of the cord. It, undoubtedly, plays an important role in the production of the symptoms.

Scarcely less significant than the vascular symptoms and partly dependent upon them are the interstitial changes in the gray and white matter of the cord and brain axis. They consist in an infiltration of cells which is both diffuse and focal in character and a proliferation of the glia cells. The diffusely infiltrating cells appear to come from the vessels and in appearance and staining qualities they resemble the mononuclear round cells of the adventitial infiltration. The anterior horns of the cord are more infiltrated than the posterior, probably because of their richer vascularity and one horn may be more affected than the opposite one. The gathering of cells which form foci in the gray matter are partly made up of lymphocytes and partly of polynuclear cells of unknown origin. Some of these latter are undoubtedly young glia cells. They are not polynuclear leucocytes because no one has demonstrated granules in them. Contrary to the observations of Harbitz and Scheel, we do not believe these foci give rise to abscess formation. They always lie in proximity to a blood vessel and while most numerous in the anterior horns of the cord, they can be seen in the medulla, pons and in the gray matter surrounding the iter. We found one such focus in the cerebral cortex though we have no doubt more are present in those cases presenting the clinical picture of an encephalitis.

It is a now firmly established fact that the pathological process in acute poliomyelitis is one which is primarily dependent upon the vascular and interstitial tissue changes and that the ganglion cells are secondarily affected. The changes in the ganglion cells vary from mild tigrolysis to complete degeneration and disappearnace. The axone is the last cell structure to disappear and this may account for the absence of degeneration in the nerves of early cases when they are stained according to the method of Marchi. The ganglion cells most affected are those in the anterior horn of the segments of the lumbosacral and cervical enlargements. The cells are not degenerated in groups, hence the absence of group paralyses. The ganglion cells which are degenerated always lie in an area which is markedly infiltrated but the converse is not true for often normal ganglion cells can be found in an area of intense inflammatory change. The ganglion cells of both anterior horns at the same level are not affected to the same degree. No ganglion cell is immune to the action of the virus. The cells of Clarke's column usually, but not always, escape because the dorsal cord is generally not the seat of severe inflammation. The ganglion cells

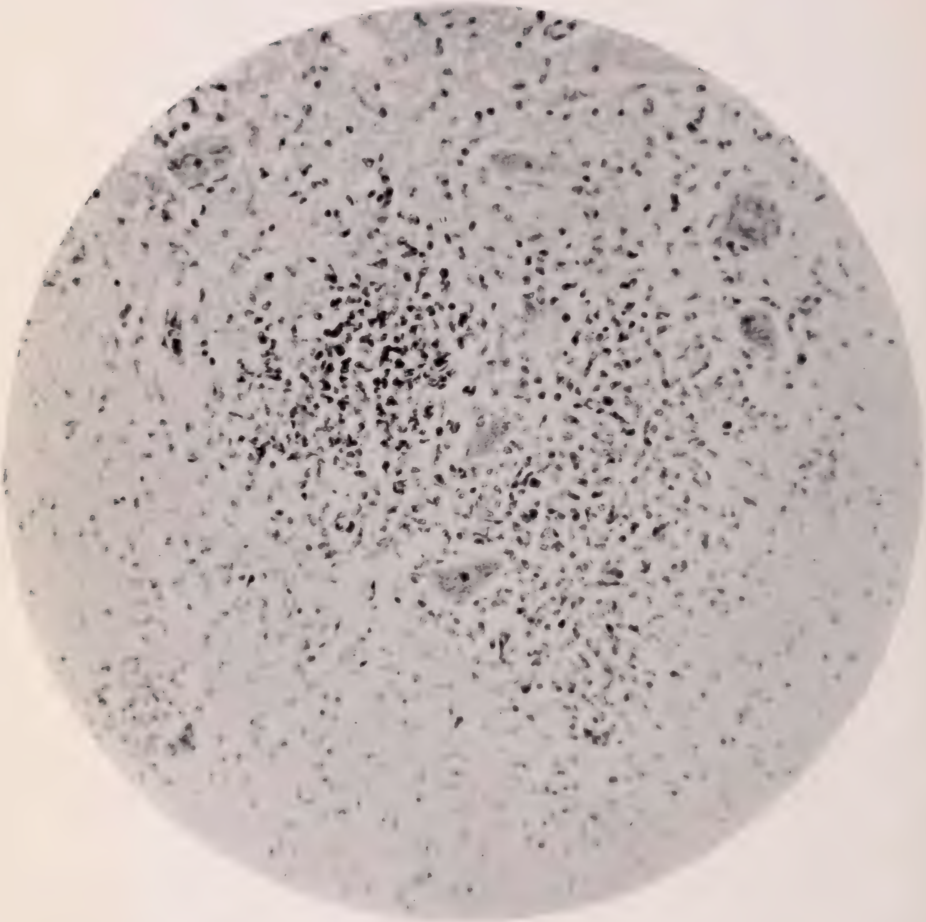

Fig. 6.—A focus of polymorphonuclear cells in the anterior horn of the cord and also the degenerated ganglion cells in proximity to the focus.

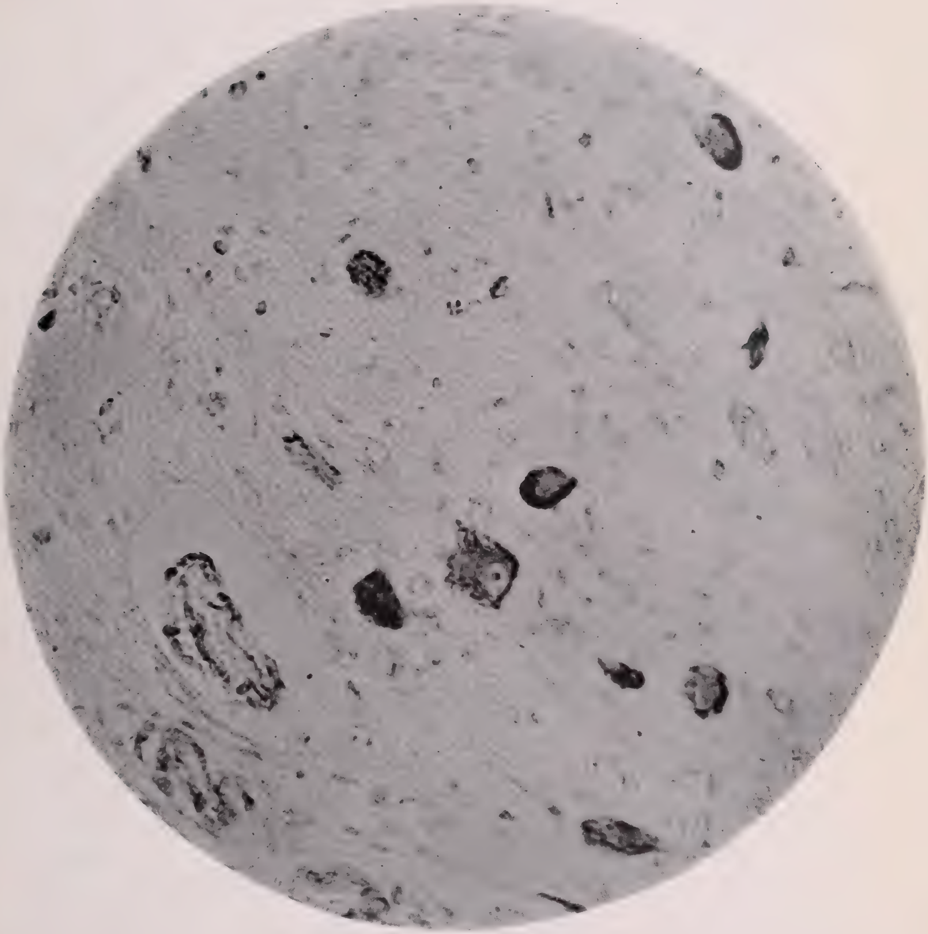

Fig. 7.—Poliomyelitis in the monkey, showing the degeneration of the ganglion cells in the anterior horn of the cord.

of the nuclei of the bulb usually show very little morphological change. This is true even of those cases in which the bulbar symptoms were very pronounced. It has been recognized, however, for some time that the morphological appearance of the ganglion cells is no certain guide as to their functional activity and that the cells of the nuclei in the medulla and pons, especially, can be seriously impaired functionally and yet exhibit no cytological alteration. This must also be true to some degree of the ganglion cells of the cord, for otherwise it is difficult to account for the extensive paralysis in fatal cases when we find so many ganglion cells apparently unaffected.

While Charcot erred in ascribing the role of primary importance to the degeneration of the ganglion cell and underestimating the significance of the vascular and interstitial changes, yet in a sense he was correct in his view because it is the affinity which the virus of poliomyelitis has for the ganglion cell which characterizes the disease. It appears also as if the virus has an especial affinity for the anterior horn ganglion cells. One reason these cells are easily affected is because they lie in the most vascular part of the cord and the virus traveling either in the vessels or in the lymphatics along the vessels reaches them first and with greater intensity. But in order to account for the early involvement of the lumbar cord in man and in experimental poliomyelitis in monkeys even when the virus is introduced intracerebrally, must we not assume either a special affinity for or a lessened resistance against the virus on the part of those ganglion cells?

We have already mentioned the mononuclear-celled infiltration of the posterior root and the membranous covering of the spinal ganglia, but in five cases we have found that the spinal ganglia themselves are diffusely infiltrated with round cells and the endothelial cells of the ganglion cell capsules are swollen and somewhat increased in number. This finding, taken in conjunction with the close resemblance of the histological picture in the cord to that found in rabies which Wickman was the first to point out, and the occurrence of ascending paralysis in rabies, led us to suggest when we read our first paper in January, 1909, before the New York Neurological Society, that the virus of poliomyelitis might be found to resemble that of rabies.

The internal organs exhibit changes such as are to be expected in an infectious disease. The lungs are invariably congested and contain areas of broncho-pneumonia—probably aspiration pneumonia. The liver and kidneys are the seat of mild parenchymatous degeneration. An acute exudative nephritis was present in two of our cases. The spleen is always congested, firm and not greatly swollen. In three instances we noted a very marked hyperplasia of the Malpighian bodies and a very peculiar proliferation of the endothelial cells. But the most striking and significant lesion in the internal organs is the acute enlargement of the solitary follicles and Peyers patches of the small intestines and the acute inflammation of the mesenteric glands. We have found this involvement of the lymphatics in every instance where we had the opportunity of examining the intestines and in one case the inflammation had gone on to ulceration of the follicles and patches. Krause and Meinicke and others have since observed this lesion in their cases. The presence of this lesion taken in conjunction with the history of anorexia, vomiting, and diarrhea which often occurs early in the disease led us to the assumption that the gastro-intestinal tract may be one point of entrance of the virus. On this theory Huntoon and myself inoculated a monkey subcutaneously last August with the mesenteric glands of a case but with negative result. Since then Flexner and Lewis have succeeded by introducing the gland intracerebrally. Krause and Meinicke working on the same hypothesis fed a monkey with the intestinal contents of a fatal case of poliomyelitis with negative results. Leiner and Wiesner then fed a monkey with the virus, by introducing it into the stomach with a catheter, thus avoiding the possibility of nasa-pharyngeal inoculation, and prevented its rapid excretion by the administration of opium. Their monkey became paralyzed and thus they proved the possibility of the intestinal route of infection. Flexner and Lewis have successfully inoculated a monkey by introducing the virus into the nasopharynx after they had previously scarified the mucus membrane. This experiment admits of criticism on the ground that

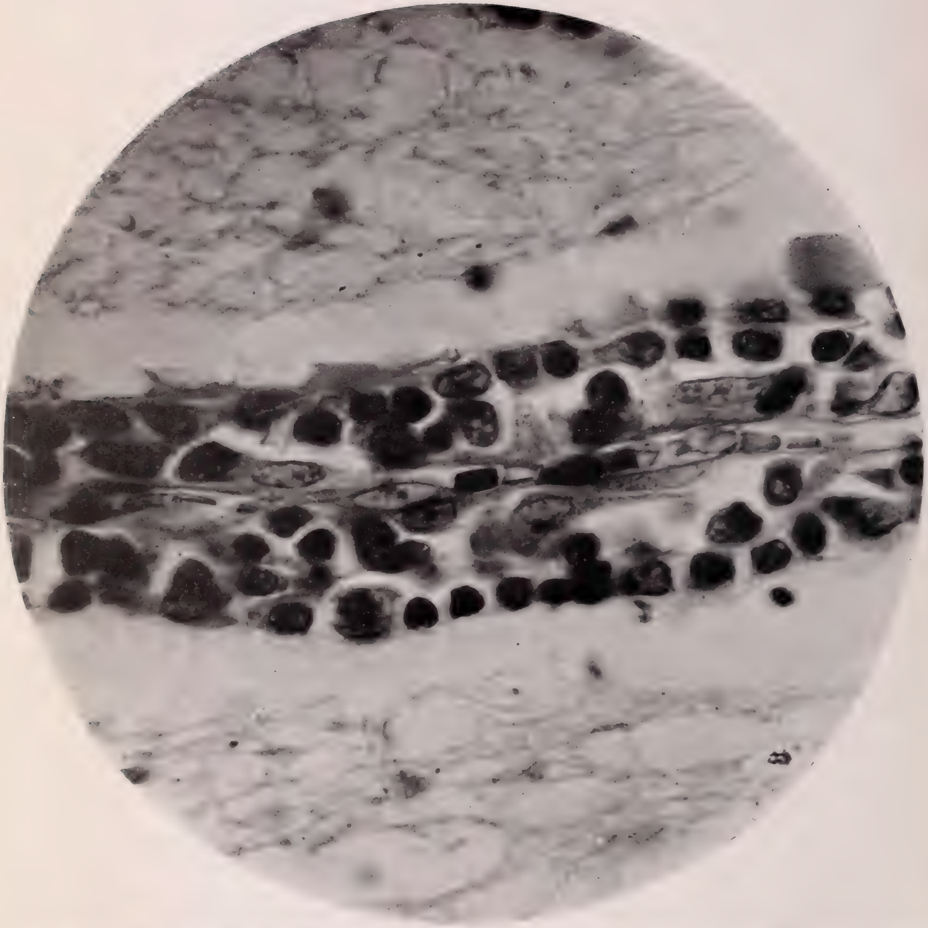

Fig. 8.—Showing the adventitial infiltration of cells-immersion lens. Note the mononuclear and endothelial-like cells in the intra-adventitial lymph space.

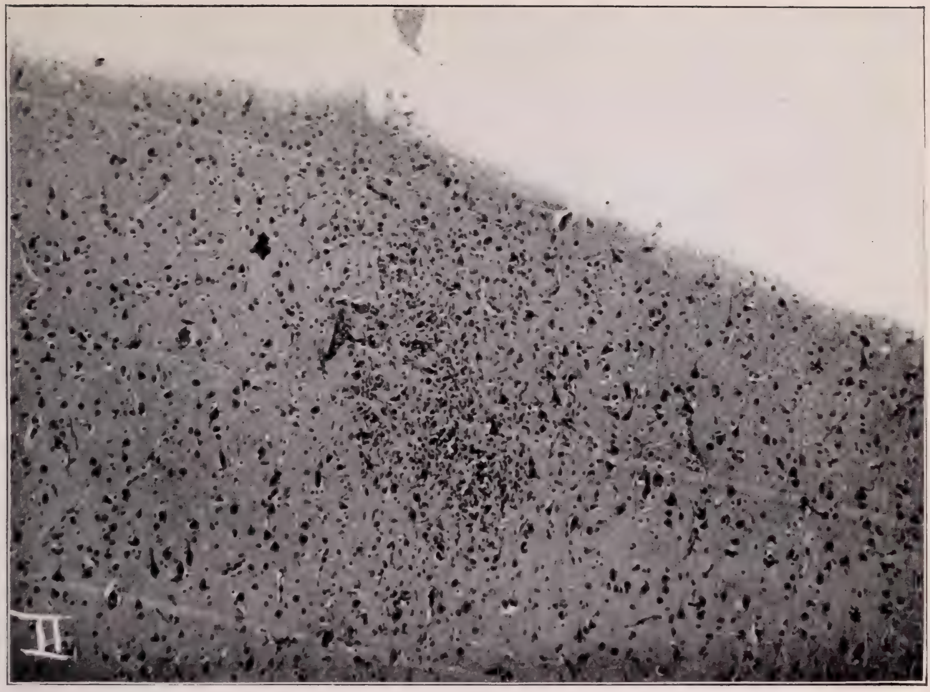

Fig. 9.—A focus of mononuclear cell infiltration in the cortex cerebri.

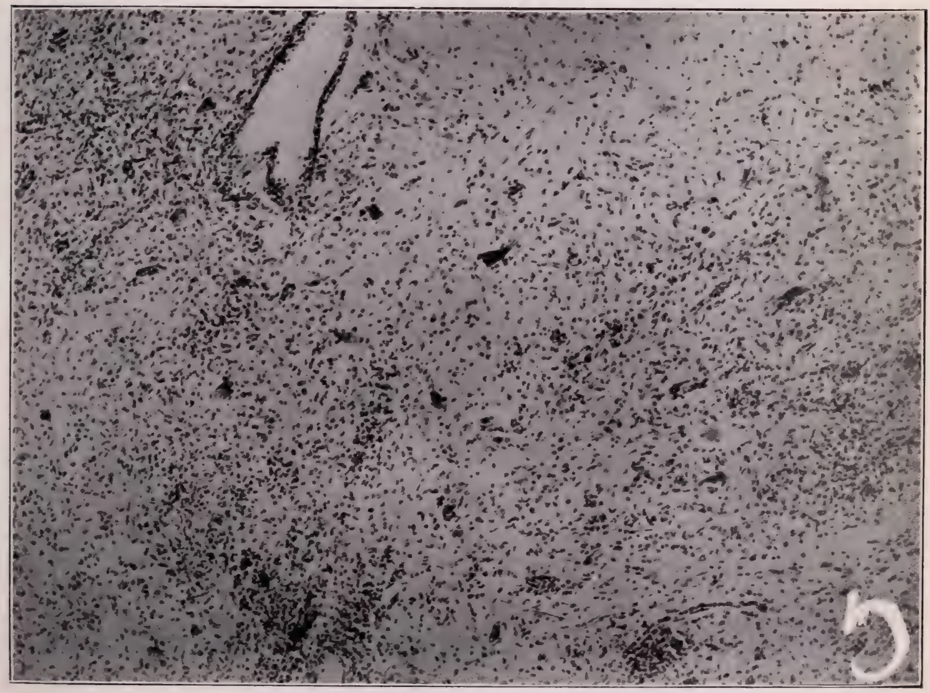

Fig. 10.—Fifth cervicle segment showing infiltration of anterior horn (especially processus ventralis medialis) and degeneration of ganglion cells.

they have thus introduced the infective agent more or less directly into the blood or lymphatic circulation.

It may be objected that the acute inflammation of the intestinal lymphatic tract is due to the elimination of the virus or its toxine. This does not seem probable to me because it occurs so early in the disease. In one of my cases death occurred only three hours after the onset of the paralysis and yet the acute swelling of the follicles and glands was very marked.

It occasionally happens that the onset of the disease is accompanied, or it may be preceded, by an attack of angina, tonsillitis, bronchitis or even broncho-pneumonia and it may be that these conditions are due to the entrance of the virus.

Poliomyelitis belongs to the class of diseases such as rabies, yellow fever, and foot and mouth disease, which is due to a filterable virus. It resembles rabies, in that rabies frequently causes ascending paralysis and produces a very similar lesion in the cord, and spinal ganglia. Moreover, Levaditti and Landsteiner have shown that monkeys may be immunized to the virus of poliomyelitis by inoculating them with attenuated cord virus according to the Pasteur method. The virus of rabies is not disseminated by air contagion although experimentally it has been shown that dogs become rabic when the virus is applied to the normal mucous membrane of the nose or throat. Yellow fever was considered to be a highly contagious disease by everyone but Finlay, until it was demonstrated that it could only be transmitted by the Stegomyia fasciata. Foot and mouth disease, however, can apparently be transmitted by direct contagion or by secondary carriers. It may be that poliomyelitis resembles this latter disease in this respect more than it does the others. The epidemiological data of Wickman and latterly of Mueller cannot be relied upon as conclusive proof of the contagious theory. In considering the gastro-intestinal tract as a possible site of invasion we must not lose sight of the fact that the disease occurs occasionally in breast-fed children. Further research may show that both the naso-pharynx and the gastro-intestinal tract may be paths of invasion.

The length of this paper does not permit of the discussion of the distinction between Landry's paralysis and acute poliomyelitis other than to remark that many reported cases of the former are undoubtedly cases of acute poliomyelitis. There are cases of ascending paralysis, however, which both clinically and pathologically must be classed under the heading of Landry's paralysis if Landry's definition of this disease is adhered to.

In conclusion we wish to call attention to the interesting relations existing between the pathological changes and the clinical picture in poliomyelitis. The rapid disappearance of the extensive paralysis which is often present even in the sporadic cases is probably due to a subsidence of the inflammatory edema which has interfered with the conductivity of the nerve fibres. We find a similar condition in the action of the collateral edema which causes the paraplegia of Potts disease of the vertebrae. Furthermore, many of the cells at any one level of the cord are either not at all or only slightly affected and probably undergo a rapid restitution of function. Sporadic cases rarely, if ever, have symptoms referable to the meninges, probably because the virus is not virulent enough to cause the pial infiltration of the fatal cases. The extent of the paralysis gives no idea of the extent of the lesion. As we have before remarked, the bulbar cases may have a cord involvement and yet have no symptoms of such. We believe from our study of these cases that in every case in which the cord is affected there are some inflammatory changes in bulb even though no symptoms are present. This conclusion is based on the fact that even in those cases where death is due to respiratory failure the examination of the medulla oblongata and pons shows a surprisingly intense inflammation extending up into the basaganglia and yet causing no other symptoms than paralysis of the motor nucleus of the vagal and glossopharyngeal nerves.

We are dealing with a disease in which in the vast majority of instances we are handicapped by our inability to recognize its presence until the damage, often irreparable, is done. It seems to me that our hope for the future lies in two directions: that we may discover some means to check the advance of the disease once it has attacked the ganglion cells and what is even more important to find the source of the infection and prevent its spread.*

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*We are indebted to Leopold Jaches, M. D., L. L. B., instructor in Microphotography of the Cornell Medical College, for the excellent microphotographs.

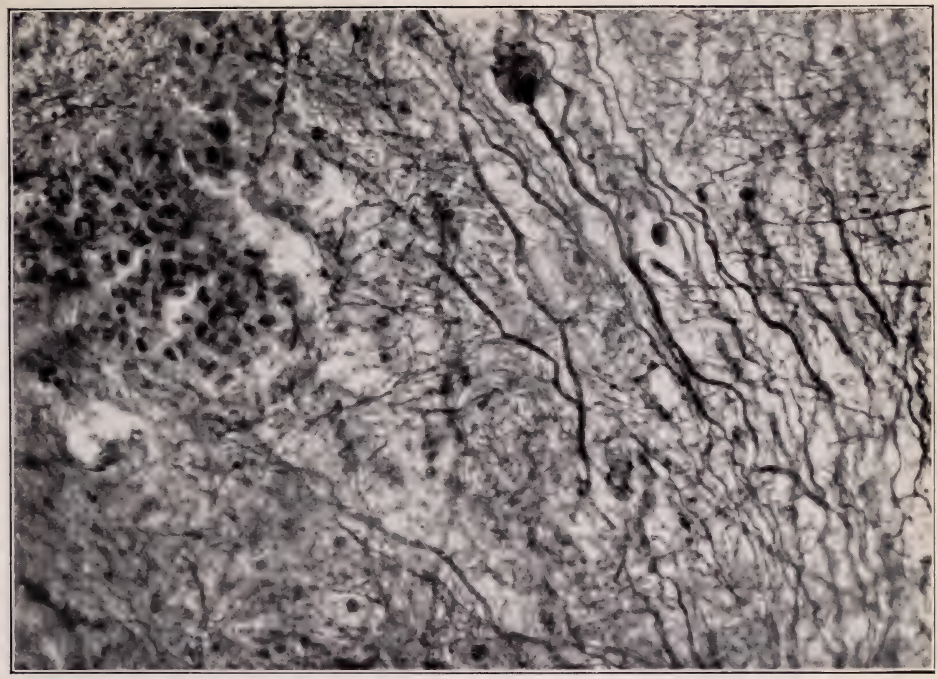

Fig. 11.—Ganglion cell of the anterior horn which has completely degenerated but still shows the presence of the neuraxon.—Bielschowsky's method.

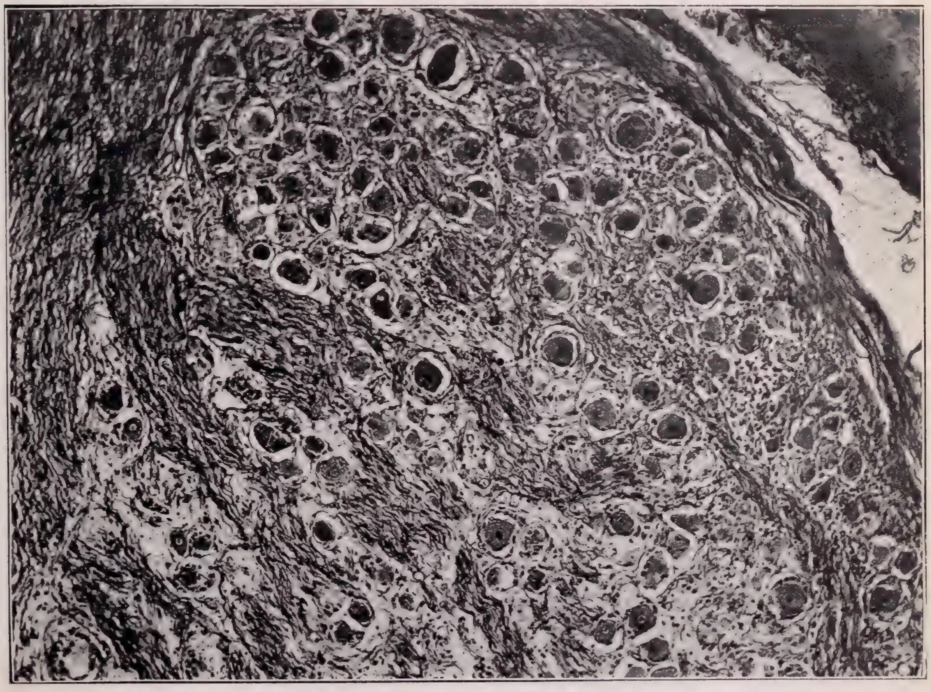

Fig. 12.—Showing the infiltration of mononuclear cells in the spinal ganglion.

EXPERIMENTAL POLIOMYELITIS.*

BY

SIMON FLEXNER, M. D.

New York

Mr. President, Ladies and Gentlemen:

I am not a member of this society and I regard it, therefore, as a great distinction to be asked to come here and present to you the results of an experimental study into the causation and pathology of epidemic poliomyelitis. You need not be reminded that this state has suffered severely for three years from an epidemic of this disease. I am not very familiar with the extent to which the disease prevailed in this region, but it appeared in Greater New York in 1907 and it reappeared there, but luckily on a less extensive scale, in 1909. Up to recently we have had no satisfactory knowledge of the casuation of this very destructive disease. Indeed, our ignorance has been so profound that we had no knowledge as to how the poison gained access to the body, and we have, therefore, been unable and are still unable to carry out any efficient prophylaxis against the disease. In other words, the medical profession has been quite as helpless in respect to this disease as has been the laity. The disease has a curious history. Its appearance has been very mysterious in the past and it has usually had its own way. Now, it is to be hoped that we have entered upon an era of knowledge respecting the disease; and it is well to emphasize here in this city, the capital of this State, where the law-makers of the State assemble every year, that whatever knowledge we have now secured and are promised in the future, grows out of the fact that animals have been used for experimental purposes for the benefit of the human race in the investigation of this disease.

Until recently it has been a disputed question whether or not poliomyelitis is an infectious disease. That question can now be answered absolutely and with just as much conclusiveness as we can answer respecting tuberculosis. It is an infectious disease. It is caused by a minute micro-organism that has not certainly been seen under the microscope, but yet can

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*Read before the Annual Meeting of the Medical Society of the State of New York. *State Journal of Medicine*, July, 1910.

be defined and studied as though it were visible. It is still an open question whether polimoyelitis is a contagious disease, and if there is time we can discuss that point with some profit toaay.

In the first place, you know, poliomyelitis is a disease which prevails chiefly in the earlier years of life, but is by no means limited to childhood. Severe cases of it arise among adults as well as among infants and children.

The seat of the disease is for the most part and in most cases the spinal cord, but the disease also attacks the brain, although less commonly, and it is a mistake to suppose that the lesions are strictly those of an anterior poliomyelitis. Indeed, the disease is not a poliomyelitis at all; its effects are not confined to the gray matter of the spinal cord or the brain, but they are present in the white matter also, and both in the anterior and posterior horns. Properly speaking, therefore when it affects the cord it is a diffuse myelitis, and when it affects the brain it extends well beyond the gray matter and becomes a diffuse encephalitis.

Now the disease has been transferred to lower animals and it is of the disease in animals I wish especially to speak and from it to draw lessons with respect to the spontaneous disease in the human being.

In 1907 we had at the Rockefeller Institute our first access to cases of poliomyelitis. We were limited in that investigation to spinal fluids, removed by lumbar puncture, and we failed absolutely to convey the disease from human beings by means of this fluid to the lower animals. At that time we had the idea that by using the lower animal that is nearest to man for experimental purposes, namely, the monkey, we might achieve something and we transferred this fluid to the monkey, including its introduction into the central nervous system, but without producing any pathological effect which we could recognize. In other words, our work of 1907 was a failure. We made strenuous efforts to get material from autopsies and did not succeed. The disease reappeared in 1909 in a localized epidemic, chiefly in Brooklyn, and to some extent in the neighborhood of New York, and during the period of a few weeks, during which the epidemic prevailed Dr. Lewis and I secured specimens of the spinal cords from two children who had died. In one case we got about two inches of the lumbar cord, and in the other we got the entire spinal cord. Both of the cases were relatively acute. One child died on the sixth day of paralysis and the other on the third or fourth day. With that material our experimental work was begun and is being continued at the present time. We had originally the idea of introducing the nervous material directly into the brain in order to bring the virus or poison of the disease into immediate relationship or contact with the central nervous system on the supposition that it would have a better chance to survive there than if it were brought into the circulation or into some other portion of the body. Luckily that idea proved to be well-founded. In the meantime, and during the summer of 1909, there appeared a publication from Vienna to the effect that the introduction of the spinal cord from a case of poliomyelitis into the peritoneal cavity of the monkey produced, after a period of incubation of some days, effects and symptoms in the monkey corresponding with those found in the human being. But the discouraging point of this publication was that the efforts to continue the transfer of the virus from the first monkey to second one entirely failed. It remained therefore an open question whether what has been produced was merely a transfer of the poison of the disease to the lower animal to which the effects were due, or whether the virus itself had been implanted. The introduction of the intra-cerebral mode of inoculation has removed all difficulties in the way of continuous transfer of the virus from one monkey to another. So the virus from the two cases is being continuously transferred. It is now in the twentieth generation, and is more active now than at the beginning, the successful transmissibility of the virus. It has been transferred from animal to animal without break and has passed through a considerable number of monkeys. Apparently the virus can be transferred indefinitely. Thus it has been proven in a relatively short time that epidemic poliomyelitis is an infectious disease and is due to a living virus, because we know of no disease that can be successfully transferred through a long series of animals which is not due to a living virus; and therefore, we have a right to assert that the cause of this disease is definitely a micro-organism quite as much as the bacillus of tuberculosis is the cause of tuberculosis.

Now, the effects in the monkey are like those in the human being. After the injection of the virus, which is made through a trephine opening in an etherized animal, and after the animal recovers from the etherization there is a period varying considerably in length—the shortest time being four days and the longest time thirty-three days—during which the animals appear quite normal. As a rule when the monkeys become sick they become sick very quickly. Within an hour a profound change may occur; and after one or more additional hours the paralysis develops. In other words, the history of the animal disease reproduces the history of disease in human beings. In some cases the progression is less rapid. The animal seems to be a little unwell. It does not move around as actively as before, and the paralysis comes on twenty-four or forty-eight hours later; so that the two types described in human beings appear in monkeys. The extent, location and degree of the paralysis vary in monkeys as in human beings. The paralysis affects the lower extremities in more than one-half of the cases, while in others there is paralysis affecting the upper extremities and medulla. The paralysis begins in the upper or lower extremities and extends either up or down. When the medulla is involved there is interference with respiration, and death may occur from sudden convulsions. Facial paralysis also occurs, but less often; and in other cases there is mere weakness of muscles and recovery. Still other animals show few symptoms and never become frankly paralyzed, so that it can be stated that the monkeys reproduce the various types of the disease recognized in human beings. Furthermore, the disease in monkeys is highly fatal. In human beings the fatalities vary considerably. In some of the epidemics the mortality has been as high as 30 per cent., but usually it is much lower. In monkeys the mortality of a series of more than 100 animals has approched 50 per cent., so that it is a severe disease in these animals. On the other hand, some of the animals recover after paralysis and a small number escape infection altogether. Those that recover may get entirely well, but if the paralysis is considerable they usually present residues as do human beings.

We have studied this virus in various ways and have made out the class to which it blongs. It is an example of the so-called filterable virus. The organisms constituting it are so small they cannot be resolved under the microscope and are small enough to pass through Berkefeld earthen filters. The organism passes readily through filters that are close enough to keep out all bacteria. It also passes through a Chamberland filter, which is the closest filter known, and through which bacteria will not go at all until after a long time and under great pressure. Hence it must be classed among the filterable viruses of which we now know several causing diseases in animals and at least one other causing a disease in human beings. I should remind you that yellow fever is apparently caused by a virus that is filterable. There is at present no direct mechanical means which will succeed in making these organisms visible. On the other hand, it may be possible to demonstrate them indirectly by means of dark-field illumination, and possibly by means of the ultra-violet rays which we cannot see, but which these particles will stop, and which affect the photographic plate.

In the course of this study we have also investigated the conditions of resistance of the virus. The virus withstands great cold. It can be kept frozen for many days, nearly two months, without undergoing any diminution in its activity. If permitted to undergo a process of slow autolysis in the nervous tissue, it does not suffer any change that we can recognize. It will stand drying for many days over caustic potash, which renders the spinal cord brittle and dry, without losing its activity. Hence it belongs to the class of highly resistant viruses or organisms that include the virus of rabies and of vaccinia.

We have also studied the question as to whether an animal which has received a successful inoculation, with this virus, and has recovered, is capable of reinoculation. A satisfactory answer to this question will determine whether or not one attack of the disease in man affords immunity. We have ascertained that we cannot reinoculate an animal that has recovered from the disease itself. Of course, since we have only been working with the experimental disease for four months, it must be considered possible that after a lapse of many months, or a year or two, the animal may be subject to reinfection. In this connection it would be interesting to know if any one here present has any knowledge of a person who has suffered from a second attack of epidemic poliomyelitis. From the standpoint of our knowledge of the class of micro-organisms to which this one belongs, it may be predicted that a very strong immunity will be rendered by a single attack of poliomyelitis. The testing of such a prediction would be rather difficult, because luckily, until recent years, we have been spared these epidemics. It appears, however, that they are becoming more frequent, not only in this country, but in Europe, and that epidemics have been more common in the last ten years than in all previous times as far as we can tell.

Now, gentlemen, I am sorry I can say nothing to you concerning a therapy of this condition, because nothing has been accomplished in that particular direction. The subject has been one that has attracted our attention, but I can offer nothing at the present time in the way of treatment.

I wish I could tell you something definite concerning the way in which this virus gets into and out of the body, but our knowledge on this point is still very fragmentary and it will have to be increased before we can institute proper measures of prevention of the disease. One or two facts are of importance in this regard. We have no evidence that any of the filterable viruses live a saprophytic existence, but the viruses have thus far been found only in connection with animals which have been diseased or which acted as passive carriers of the infection in the manner of bacteria carriers. In other words, we know nothing of this virus in nature apart from its host, through which infection can take place. The probabilities are that it will be discovered not only in connection with persons who suffer from poliomyelitis, but who are passive carriers of the disease. Wickman's study of the Swedish epidemic indicated that this kind of double transportation of the disease directly by contact and indirectly from carriers occurs. In recent years the further idea has been gaining ground that epidemic poliomyelitis is a contagious disease, and bears some relationship in respect to its prevalence to epidemic cerebrospinal meningitis. I wish now to state that it is not improbable that the mode of entrance and exit of this poison may be the same as the mode of entrance and exit of the poison which causes epidemic cerebro-spinal meningitis, and the two diseases may be disseminated in much the same way. It is true that they appear at different seasons. Epidemic poliomyelitis reaches its height at mid-summer, and epidemic cerebro-spinal meningitis its height in the late winter and early spring, but they sometimes overlap or succeed each other by short intervals, and hence the two diseases have been confused one with the other. In the case of epidemic cerebro-spinal meningitis the infection takes place probably in a great majority of cases through the naso-pharynx. The evidence for this fact is found in the presence of diplococcus intracellularis in the naso-pharynx, not only in those who suffer from the disease, but in those who act as carriers of it. The diplococcus gains entrance into the naso-pharynx from other patients through ordinary modes of contamination with the secretions, and in addition, in those suffering from epidemic meningitis, there is reason to believe contamination of the naso-pharynx occurs from meninges through the cribriform plate. It is for this reason that a person suffering from epidemic cerebro-spinal meningitis so often shows the diplococci in his nose. There is little doubt that the diplococci enter there and make their way to the pia arachnoid and it has now been shown that they can pursue the reverse path and reach the nasal mucosa. This is a difficult thing to prove in the human being, but we have shown that if the diplococci are injected into the lower part of the lumbar cord in monkeys that they find their way into the nasal mucosa. If this path can be traversed in the monkeys, surely it can be followed in man.

Now as regards poliomyelitis, there are changes in the cerebro-spinal fluids of the monkeys which develop epidemic poliomyelitis after inoculation. The fluid is slightly opalescent, contains an excess of lymphocytes, and at the height of the paralysis may undergo spontaneous coagulation. The virus has been demonstrated in the fluid, and we have found that when the virus is injected into the spinal membranes by lumbar puncture, infection takes place and paralysis results.

Hence it appears that the membranes of the brain and cord may both contain and transmit the virus to the nervous tissues. Furthermore, we have ascertained that the naso-pharyngeal mucosa contains, at times, the virus and a filtrate prepared from it will transmit the paralysis. To that extent the chain of evidence is complete.

There is an important practical suggestion contained in this fact which I would like to present to you: In the absence of other knowledge more convincing as to the mode of spreading the disease, I think it would be for the present a safe plan to look upon the naso-pharynx as that part of the body most concerned in disseminating the virus of poliomyelitis, and to secure protection from it by employing isolation and other measures in dealing with epidemic poliomyelitis, as is now done with cerebro-spinal meningitis. In the absence of any efficient mode of treatment of poliomyelitis protection must be secured entirely through preventive measures. Whether the experimental studies here summarized will lead to progress in the therapeutics of the disease cannot now be stated.

Discussion. Dr. Mark Richards Crain, Rutland, Vt. (by invitation): My experience in poliomyelitis is limted to sporadic cases which occurred in the year 1895, when in Rutland, Vt., we had an epidemic which at that time was not reported. The President of the State Board of Health of Vermont at that time collected 144 cases; probably some cases were reported. I only saw the late results in these cases. I recollect one case of a father and mother who had only one child and they were very much alarmed and sent the child away. The child was four or five years of age. They kept the child away until the epidemic subsided. Then the boy returned and he was taken with the disease. He was badly crippled in one leg, but otherwise was in good health. He is now a healthy young man. I thought it was simply a case in which the disease was limited to the anterior horns of the cord, but I saw many cases in consultation in which I was in doubt from the clinical symptoms as to the nature of the disease. It was an acute infectious disease that I saw and it presented a great variety of symptoms. The death rate was very small. We were unable to get any post-mortem examinations. There were several cases that died with marked cerebral symptoms. One case I have in mind had strabismus, and another case, a child, became feeble-minded after an attack of the disease. I saw one or two cases that ran quite a high temperature.

I have been very much interested in Dr. Flexner's remarks in showing that it is an infectious disease and that from our early descriptions and post-mortems of it that it is a disease of the motor cells and anterior horns of the gray matter.

Dr. Joseph Collins, New York City: My emotions have been so stirred by this remarkable contribution that I can scarcely trust myself to speak on this subject.

One of the greatest ambitions of the medical profession for the past fifty years has been realized and set forth in the message that has just been spoken to us. This is one of the most perilous diseases afflicting the human race, and the discovery of its cause, which we have heard today, is certainly an epoch-making contribution. I saw nearly 600 cases of epidemic poliomyelitis in the epidemic in New York two years ago, and those cases carried home to me everlasting and profound sorrow, and to hear now that the beginning of the end of that disease is at hand, and through the same master mind that has robbed us of the dread of epidemic cerebro-spinal meningitis is surely an occasion which will make this an epochal meeting of the New York State Medical Society.

Dr. Flexner (closing the discussion:) I wish to thank you, Mr. President and gentlemen, and particularly those who have discussed my paper, for their remarks.

A SMALL EPIDEMIC OF SEVENTEEN CASES OF POLIOMYELITIS

BY
JOHN MILTON ARMSTRONG, M. D.
St. Paul, Minn.

In order to make up a report on the epidemic of Infantile Paralysis which occurred in this City during the months of August, September and October, 1909, a request for case histories and the filling out of a blank containing a number of questions, which it was thought might throw some light on the epidemiology of the disease, was requested of the physicians of St. Paul. While 238 cases with 48 deaths were reported to the Health Department the response to the request for case histories was not as generous as was hoped. However 124 case histories were obtained though some were far from complete. In addition 87 of the question blanks were returned which were complete enough to tabulate.

As my space is somewhat limited, I have selected as the basis of this paper 17 cases of this disease which occurred in the town of North St. Paul, and the adjoining village of Castle. These 17 cases constitute, it is believed, the entire number of cases occurring there. The case histories are more completely worked up than the St. Paul cases as a whole and they offer good material for the discussion of the symptomology and of the two interesting questions, Is the disease contagious? and, What is the status of the "abortive form" of the disease as described by Wickman?

I shall first give the case histories, then a chart showing the connections between these cases and some others, and lastly a table showing the answers to some of the questions sent out by the Health Department, which are of sufficient importance to be tabulated.

It is only just to state that these children, whose clinical histories are given, were either patients of Dr. E. W. Cowern of North St. Paul or that the cases came to his knowledge. The histories as given are his and the diagram showing the connections between the cases is his also.

North St. Paul is a village of 1400 people lying north-east of St Paul on the White Bear and Stillwater trolley line and about eight miles from the center of our city. It has its own school which opened on September 6th.

Case A. D. W., female, aged five years. Aug. 5, 1909, ate raw pears. Aug. 6, feverish, vomiting, diarrhea; parents gave castor oil. Aug. 7, child called to mother to take her out of bed as she could not walk. Aug. 9, mother brought her to office to see why she couldn't walk, temp. 101° in groin; right lower extremity paralyzed from hip down; pain in right calf. Aug. 10, temp. 100° at night 101°; patellar reflex absent on both sides; plantar present on left side; tenderness behind left knee. Aug. 11, left leg tender and somewhat affected; temp. 101°. Aug. 12, temp. normal; left leg better. Aug. 13, feels well, singing, etc.

Subsequent history: The paralyzed extremity was decidedly sensitive for several weeks. With the subsidence of the tenderness, massage and faradic electricity were used and are still being used, Feb. 19, 1910. There is a good deal of wasting but the child feels well and can walk nicely, with the typical gait however.

Note: D. became ill Aug. 6. Her grandmother visited her Aug. 24, and about Aug. 26 visited a daughter, Mrs. F. of Carver, Minn. Mrs. W. of St. Paul, another daughter, took her small child and went to visit Mrs. F. While there the child became ill and was taken back to St. Paul developing a paralysis, Aug. 28th. On Aug. 30th, a child of Mrs. F. also became paralyzed. So far as known this last was the only case of this disease in Carver. Is it possible that the grandmother carried the contagion to Carver and infected both the W. and the F. children?

Case B. V. H., female, aged three years, nine months; Aug. 27, ate a pear at supper and vomited it immediately; ate no more supper; passed a good night. Aug. 28, vomited everytime anything was given her, including water; was sleepy, but played around more or less; at 8 P. M. physician called; temp. 120°; knee jerks present, pupils reacted; Kernig's sign absent; gave calomel and ordered baths; ice to suck rather than water to drink. Aug. 29, at 8 A. M., father reported child as being about the same; saw her at 12 M.; temp. 100.3° slightly jerky; no other symptoms except that she vomited every time anything was given her; at 8 P. M. father reported a rattling on her throat and occasional ejection of frothy substance from the mouth; also said that every time she attempted to drink it seemed to choke her and came out through the nostrils; said this came on at 3:30 P. M.; when I saw the child the throat was found filled with saliva and air bubbles; gave her a half teaspoonful of water which promptly returned through the nostrils; saw child again at 9:30, same condition; temp. 100.5°; knee jerks and pupillary reactions good; child looked well except for paralysis of deglutition; pulse good, etc. Aug. 30, father called me at 2 A. M.; child much worse; pronounced it dying; died at 4:20 A. M.; no convulsions; no other paralysis.

Note: No connection between this case and any other as far as known. This was the second case, the first being at least a mile away.

Case C. C. J., female, aged six years. Sept. 3, child did not appear well; had a headache. Sept. 4, felt quite ill; wanted to lie down; feverish, constipated, drowsy. Sept. 5, first seen about 5 P. M.; did not seem very sick; thought it a case of indigestion (although I had polio. in mind and tested the reflexes—with what result I have forgotten) and that a dose of calomel would fix her; gave tablet and left a solution of potassium citrate for the fever; on giving the later she vomited—vomited several times; during the afternoon the child had spoken to her mother about her left hand hurting her and said "it wanted to stay shut;" I did not notice this, neither did the child or mother mention it to me. Sept. 6, did not see the child today, but at this time the paralysis of the left hand was noticed; could not extend the fingers; child got up and aside from being weak and wobbly on walking, appeared all right. Feb. 19, 1910: child can extend the fingers and thumb, but it requires quite an effort to do so, and the fingers are usually in a state of semi flexion with distal joint of thumb semi flexed; she usually carries the left hand in the right.

Possibility of Contagion Here we have a case of direct infection; C. had spent two weeks visiting at the home of Mrs.

J's sister, Mrs. W. M. in St. Paul. In the meantime a cousin, H. M. had been visiting the J's in North St. Paul. A week before C. was taken sick she came home and H. M. returned to St. Paul. Before C. left St. Paul, her cousin, A. M. was taken ill and was in bed when C. left; A. M. developed hemiplegia. After H. M. had been at home a short time he also developed the disease.

Case D. F. M., female, aged three and one-half years. Sept. 9, complained of headache; feverish, vomiting. pain in back of neck, right knee and foot; constipated. Sept. 10, physician called; symptoms as above. Sept. 11, couldn't stand properly; right thigh abducted. Sept. 12, no urine passed for 24 hours; catheterized; started to get well after this, but it was more than a week before she stopped complaining of the pain; at first she could only walk by holding on to some one's hand.

Possibility of Contagion: None. Child next door (case E.) developed the abortive type Sept. 24th.

Case E. K. M., female, aged five years. Sept. 24, taken ill in morning, vomited, very constipated, high fever (104°), very sleepy; seen first in afternoon; symptoms as above; found she had eaten enormously of vegetables, particularly carrots; was called to see her again at 9 P. M. as the parents thought she would have convulsions—rolling of eyes; ice bag to neck, bathing, free evacuation of the bowels by carthartics and enemata. Sept. 25, practically well.

Possibility of Contagion: Child next door (case D.) was taken ill Sept. 9th. A paralysis supervened; no intercourse between the families. This child went to Sunday school with cases F and G. The last children were taken ill Sept. 30 and 28th respectively,—case G having been in direct contact with this case Sept. 26th. Two cousins of this child, cases L and M were taken ill in October, but apparently no direct connection between them and this case. This case was at first taken to be a case of indigestion and autotoxemia, but is now believed to have been an abortive type of poliomyelitis.

Case F. M. H., female, aged four years nine months. Sept. 28, taken ill on morning, constipated, vomiting, feverish, stomach rejected both food and medicine (carthartic); an enema gave a good stool containing grapes. Sept. 29, no appetite; other symptoms had subsided. Sept. 30, up and about apparently well. Oct. 1, ill again; headache, pain in back of neck, very feverish, extremely irritable, vomited medicine, bowels moved, knee jerks absent. Oct. 2, same as yesterday, except she complained of entire spine hurting, or in different places at different times; temp. 104°, quite jerky. Oct. 3, seemed somewhat better in morning but became worse again in evening; had a good night, however. Oct. 4, practically herself.

Possibility of Contagion: This child was a Sunday school mate of case E (ill Sept. 24) also of case G (ill Sept. 30). Her parents claim that aside from the Sunday school contact she had not recently played with the other children. The parents, however, had probably visited around more or less. In the interval between this child's ill spell (Sept. 30) case H also played with her and spent the afternoon at her home. Case H also played with her after her recovery.

Case G. G. H., female, aged four years four months. Sept. 30, taken ill in afternoon, vomited, constipated, very feverish, nervous and fretful. Oct. 1, first seen this P. M.; Temp. 102°, very jerky, no tenderness along spine or elsewhere; found a rash similar to the rash of scarlet fever on chest and abdomen; knee jerks present. Oct. 2, mother called me up and said child had passed a very poor night—thought she was going into convulsions—visited her and found condition practically the same as yesterday except rash had disappeared. Oct. 3, child much improved; fever subsiding and other symptoms less pronounced; child extremely weak, however; did not see child again, but she was well in a few days.

Possibility of Contagion: This child visited case E on Sept. 26. Case E had been ill Sept. 24, with what appeared to be indigestion (see case). Cases E, F and G, were all members of the same Sunday school class, but aside from this weekly contact did not see one another very often, although the parents visited more or less.

Case H. J. C., female, aged three years eight months. Oct. 4, about 3 P. M. the mother noticed that she was ill; she lay around, was tired, feverish, complained of headache and stomach ache, was constipated, drowsy and sleepy. Oct. 7, she continued as above until this date when I first saw her; temp. 104°; other symptoms as above. Oct. 8, temp. 103°; complained at times of pain in back of neck, right forearm and right leg; considerable difficulty to move the bowels. Oct. 9, temp. 101°; general symptoms improved, but had a peculiar stare to the eyes. Oct. 10, temperature normal and felt much better, although extremely weak and wobbly on attempting to walk; the stare still in the eyes; this stare continued for several weeks and gave the child a rather idiotic look; the mother said "she looks crazy." About a week before this sickness she had a couple of days' sickness when she vomited, etc.; she has these attacks of indigestion frequently, the parents not being particularly careful of her diet.

Possibility of Contagion: Might better be called probability, connected directly with case F, qv; See also cases O and P.

Case I. A. P., male, aged three and one-half years. Oct. 14, this child had eaten the day before a large piece of liver sausage; today very feverish and thirsty, sleepy, jerky, rolling of eyes, very constipated, "acted so nervous;" when touched about the waist line it hurt him and he cried; slept well all night. Oct. 15, felt pretty well till 10 A. M., then yesterday's symptoms over again; very unsteady gait; in afternoon parents gave him some beer and he vomited; slept well all night; no movement of bowels. Oct. 16, somewhat better, no bowel movement. Oct. 17, no bowel movement. Oct. 18, given a pill and bowels moved several times; felt much better afterwards.

Possibility of Contagion: Absolutely no history. This case taken alone merely indicates indigestion and toxemia. It acquires some significance, however, from its connection with cases J and N which followed it shortly afterwards. This child played with both case J and case N. While I am unwilling to call this an abortive type I report it because of its possibility of being one.

Case J. L. T., female, aged two years eight months. Oct. 20, in P. M. became feverish, lay around, twitchy, constipated, sleepy; had no appetite; had been "cranky" for three or four days. Oct. 21, much the same only more feverish; mother thought she had a cold. Oct. 23, by this time she was well again, except that a facial paralysis was present; this paralysis lasted about two months.

Possibility of Contagion: From case I (ill Oct. 14). This child's twin brother (case K) was ill Aug. 20 with a transitory inability to walk. (See case K.)

Case K. L. T., male, aged two years eight months. Oct. 21, in morning fussy, very hungry, about a good deal, very constipated; cried when mother touched his waist line and said it hurt him; very feverish and sleepy; head retracted today and next day. Oct. 22-23, fever gradually went down. Oct. 24, about this time it was noticed that his right arm drooped and he did not use it; cried when it was handled; this condition lasted about two days and then disappeared.

Possibility of Contagion: From case I a playmate who was taken ill on Oct. 14th. Possibility of a previous attack Aug. 20 when he appeared to have a transient inability to walk. This child is a large, awkward, phlegmatic type of child.

Case L. A. W., male, aged six and one-half years. Oct. 21, in A. M. when he got up complained of his back, constipated, rested often by lying down; in evening feverish and jerky. Oct. 22, felt much better but has a partial paralysis of right leg.

Possibility of Contagion: Cannot find any connection with any other case but (case M) his cousin in other side of same house who was ill at the same time and died on the 25th.

Case M. D. W., female, aged six years one month. Oct. 21, complained of stomach ache (a common occurrence); somewhat feverish, but played about. Oct. 22, not really ill until today; in afternoon complained again of stomach ache, feverish, sore throat, jerky. Oct. 23-24, appeared to be better—denied that she felt ill anywhere. Oct. 25, about as yesterday in the morning; in the evening it became hard for her to swallow; died at midnight.

Possibility of Contagion: This child's cousin (case L) on the other side of the house was sick with the disease at the same time—he developed a paralysis. I cannot connect this case with any other. This child was also a cousin of case E, but the parents deny any intercourse between the two and case E occurred a month previous. This child and case L were attended by a quack and it was therefore a coroner's case. The coroner thought she died of diphtheria and cultures were taken from nose and throat but showed only streptococci and staphylococci. At the time of the conorer's visit we looked into the other side of the house and found case L with a partial paralysis of the right leg. The mother of this child assures me that the history as given is all she knows of the case. The quack furnished me with a statement that the child died of tonsilitis and stomach and kidney disease.

Case N. F. B., male, aged three years nine months. Oct. 28, first seen on this date; complained of headache and pain in back of neck; wanted to be held all the time; had a silly laugh; no bowel movement for 36 hours; temp. 101°; mother said that day before he had been very feverish and was delirious; that he complained of his legs and arms hurting and had vomited; also that he hadn't been quite up to the mark for two weeks; had felt tired and did not want to play and had a poor appetite. Oct. 29, did not see him today; mother tells me he felt better until about 11 A. M., when he became quite feverish and was delirious; he said his throat hurt him. Oct. 30, about 3 A. M. it was noticed that he could not open his mouth; mother pried it open and gave him water which returned through the nose; I saw him at 7 A. M.; very little fever, appeared quite bright, but could not speak distinctly; I gave him water which he drank with some difficulty; shortly after I left he was again unable to swallow and was worse in other ways. "Fingers, toes, nose and ears white and cold, other parts of his body brown" (mother's descr ption); mother thought he was dying; about 4 P. M. changed for the better, but for two or three days would have spells when he could not swallow; about a week after the beginning of the first difficulty with his throat, it was noticed that his face "pulled to one side" when he laughed; at this date (Nov. 10) this condition presists; otherwise he is perfectly well and speech unaffected.

Possibility of Contagion: In regard to the possibility of contagion— a neighbor's child (with whom, however, this child had little to do) had shortly before developed a slight paralysis of the face. I did not see this last case but do not doubt that the child had a slight facial paralysis. Aside from the proba bility of actual contact with the case cited above there was a chance (although somewhat remote) of mediate contagion. This child's mother made frequent visits to an aunt who had been to see a child (or more) with the disease. Moreover, this aunt had a child "sick;" but I have been unable to find out whether it had any form of infantile paralysis. (Later information— the mother of this child—case N,—attended the funeral of her six months' old nephew in St. Paul. The child died Aug. 14, and was only ill 24 hours. The physician first called it infantile paralysis. The death certificate says the child was ill three days and died of cholera infantum). This child had as more or less frequent playmates Case I, (ill Oct. 14) and a brother of cases J and K, (ill Oct. 21 and 20 respectively.)

Case O. M. S., female, aged two years ten months. Oct. 29, 5 P. M.; seen first at this time; headache, pain in neck, couldn't lie down, wanted to be held all the time, very sleepy and jerky; temp. 102°; no sore throat, knee jerks absent, constipated; enquiry elicited the information that she had been "rather cranky" for two weeks previous; had had diarrhea for two or three days previous to my visit. Oct. 30, condition about the same, except that she complained of pain in her legs; temp. 100.3°; in the evening temp. 104.5° and she was delirious. Oct. 31, several baths during night of 30th-31st; at 2 A. M. no paralysis, but at 3 A. M. when the next bath was due it was found that she could not stand; paralysis of both lower extremities; 9 A. M. lower extremities cold and mottled up to groin; temp. 102°; 5 P. M. temp. 103.5°; seemed brighter and talked a little; no pain. Nov. 1, temp. varied between 101° and 102.5°; felt pretty well in morning, but towards evening became much worse, semi-comatose; revived somewhat about 11 P. M. and slept well. Nov. 2, moving temperature 101.5°; lay in a semi-comatose condition but could be aroused; involuntary evacua ions of bladder and bowels; lay with head drawn to right side; would not move it; said it hurt, also complained of hands and arms hurting; on raising her up found marked retraction of head, chest muscles paralized, breathing wholly abdominal; (this abdominal breathing kept up for three or four days.) Nov. 3, has a "bad spell" early this morning "like fainting;" 9 A. M., temp. 100.5°; complained of upper extremities being very sensitive to touch; cried when they were handled; she could not lift them; evening, temp. 99.7°. Nov. 4, 9 A. M., temp. 99.8°; much better; arms are extremely sensitive; uses forearms freely, but cannot lift either shoulder.

From this time on the child's general health improved rapidly. On Nov. 12 she used the right arm for the first time; the left one had recovered its functions several days earlier. On Nov. 15 she was able to extend the toes of both feet. On Nov. 18 was able to slightly rotate the right thigh.

All this time her back hurt and continued sensitive for several weeks. Early in December she developed a bad bronchitis which was rendered much more serious by her almost total inability to cough. Later on she had what must have been acute articular rheumatism but I did not see her until after the symptoms had largely subsided.

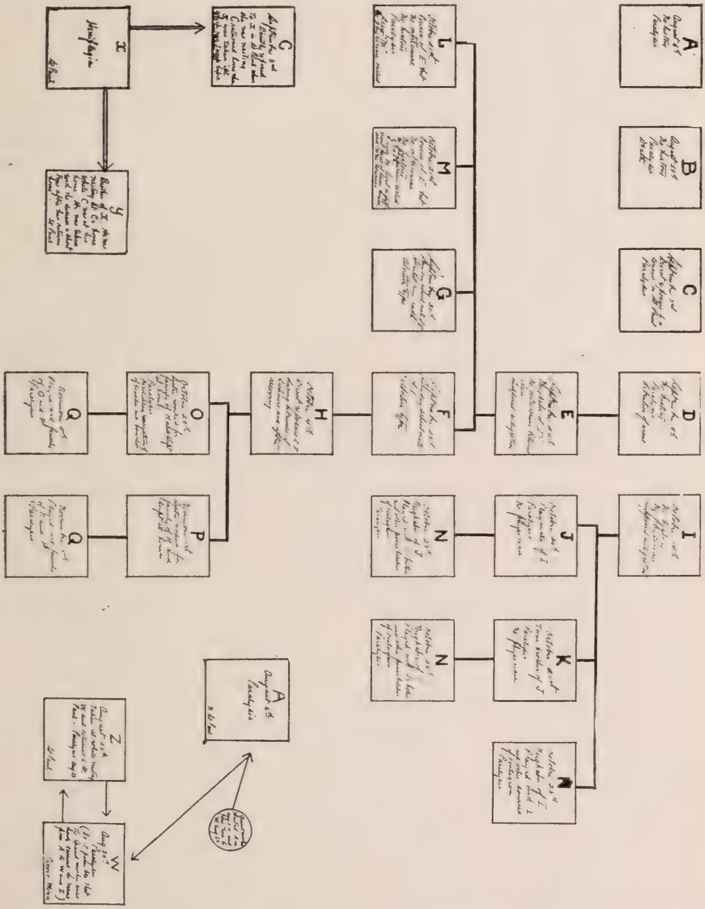
Jan. 7, 1910, is recovering nicely from the debilitating effects of the bronchitis and rheumatism; has regained complete control of bladder and rectum and of upper extremities; can flex toes of both feet; rotate right thigh; some slight movement of left thigh; still complains of pain when left lower extremity is moved and to a less degree of the right one. April 4, 1910, still complains of pain in legs; left leg still somewhat paralyzed; is still unable to cough.

Possibility of Contagion: From an older sister who worked in the family of case H (ill Oct. 7th); on Nov. 1st a brother of this child (case P, became ill with an attack of the abortive form but was well in two or three days.

Case P. A. S., male, aged five years three months. Nov. 1, complained of pain in back of neck, headache, feverish, vomited, constipated, jerky, "lay around;" these symptoms persisted for about 3 days, but for a week this child lay on its face because it hurt his neck to lie on his back.

Possibility of Contagion: This boy's sister, (case O) was ill Oct. 29, and was therefore ill at the same time this child was. The source of contagion was probably the same in both cases, i. e., through a sister who worked at home of case H, but slept at home.

Case Q. G. H., male, aged nine years. Nov. 5, slight headache and nausea; had what seemed to be a "billious attack;" is subject to them; felt well next day and was out playing. Nov. 7, in P. M. cried whenever spoken to; said he was sick; that his head and back ached, in fact everything but his arms hurt him; the pains were not constant; would cry out when they came; did not sleep well; did not seem to be feverish; ate dinner but no supper. Nov. 8, first visit 9 A. M.; temp. 100.3°; complained of occasional pains in knees and other places; cried when the pains came; said he would like to eat but it nauseated him; 12 M., temp. 100.3°; pain in knees once only since 9 A. M., 6 P. M. temp. 101.9°; headache, pain in back of neck and on anterior and inner aspects of thighs; both upper extremities had a mottled appearance. Nov. 9, 9 A. M., temp. 99.9°; complained chiefly of pain in neck; 6 P. M., temp. 99.9°; no change in general condition; hardly notices pain unless on movement. Nov. 10, 9 A. M., temp. 99.9°; got out of bed; tried to walk but fell down; could walk only when supported; said he could not do it alone; pain still in front and inner aspects of thighs; 6 P. M., temp. 99°; had vomited several times since dinner; pain in neck and along spine also in the calves; could not walk without assistance; appeared to be unable to adduct right thigh when lying in bed; muscles of right thigh and leg slow to respond to will. Nov. 11, 9 A. M., temp. 102°; no pain, except slight headache; persists in inability to walk; walks when supported but falls immediately when support is withdrawn; while sitting in a chair he cannot raise his legs; all movements much impaired and muscles very slow to act; the boy is very much of a baby and it is difficult to decide how much of his disability is real; 4 P. M., temp. normal; feels much better; left lower extremity able to perform all its functions but is not very strong; extensors and adductors of right thigh unable to do their duty, except to a very limited degree; other muscles of right lower extremity appear to be all right, except that they are weak; boy still complains of pain in back on exertion and is still unable to stand without support. Nov. 12, temp. 99.5°; vomited several times during night; (had had fried eggs and ham for supper); appears practically the same as yesterday. Nov. 13, 9 A. M., temp. 99.6°; cried during night on account of pain in back; says his heels hurt; as he lies flat in bed is unable to move right lower extremity at all, and left lower extremity to a very slight degree only; right upper extremity appears to be entirely paralyzed; the left forearm can be moved, but not the shoulder. 9:30 P. M., sent for by parents who thought boy much worse; temp. normal, almost constantly delirious. Nov. 14, 12 M., temp. normal; able to move lower extremities somewhat; able to move left upper extremity and right forearm; still somewhat delirious. Nov. 15, temp. normal; muscular movements somewhat stronger; still somewhat deliri-



Poliomyelitis,— Table showing connection of 17 cases in North St Paul and adjoining village of Castle - 1909 ous; feels pretty well and eats well; says whole length of spine is sensitive on movement but not otherwise. Nov. 16, feels much better; movements stronger and better. Nov. 17, did not sleep much on account of pain in bowels and legs; largely behind knees; otherwise feels well and movements are better. Jan. 1, 1910, this boy continued to improve slowly, but fo a long time complained of his spine and of the back of his legs behind the knees had a constant tendency to keep legs flexed; passive movements and massage used; on Christmas day he took a few steps alone; has improved in his walking since then, but has a shuffling gait and takes very short steps; keeps his head retracted while walking—occasionally falls down; is unable to fully extend right arm, except when lying down.

Possibility of Contagion: Through playing with cases O and P who were ill Oct. 29 and Nov. 1, respectively.

The question, Is the disease contagious? and What is the status of the abortive form of the disease? cannot be discussed separately as it has been rightly said by others and also appears from the above histories that the acceptance of abortive forms of Heine-Medins disease infers the contagious nature of the disease, and if we are to consider the disease as contagious, we must also admit the abortive forms.

It is true that the histories of some of the above cases taken by themselves could hardly be admitted as cases of Poliomyelitis, but as Wickman says—taken in connection with the pronounced forms and the peculiarity of the symptoms which appear different from ordinary cases of gastro-intestinal infection and toxemia, especially to one who has seen a number of these cases, the symptomatology with the exception of paralysis is the same. We must not overlook the fact that the infectious agent may and does in the epidemic form of thi disease, not only invade the anterior horns of the chord but practically any part of the central nervous system and the meninges. We often have meningeal symptoms combined with anterior cord involvement, neuritis and bulbar symptoms. I have seen all of these combinations in the same patient many times. In fact the meningeal symptoms preceed the other symptoms so that we must consider these abortive cases as cases with only slight meningeal irritation and that the organism has been able to overcome the infection before it damaged the nervous tissues to any extent.

Summary of answers to questions of 17 cases of Poliomyelitis in North St. Paul and adjoining village of Castle

Case –	A	B.	C	D	E	F.	G.	H	I.	J	K	L.	M.	N.	O.	P.	Q
Age? –	5 years	3 4/12 yrs	6 yrs	3½ yrs	5 years	4 4/12 yrs	4 4/12 yrs	1 11/12 yrs	3½ yrs	2 8/12 yrs	2 8/12 yrs	6⅓ years	6 1/12 yrs	3 4/12 yrs	2 10/12 yrs	5 3/12 yrs	10 yrs
Sex? –	F	F	F	F	F	F	F	F	M	F.	M	M	F.	M	F	M	M
Number of adults in house? –	2	2	2	3	2	2	2	2	2	3	3	2	5	4	3	3	2
Ages of children in house other than patient? –	2 & 10 yrs	6 mos	2, 4 & 8 yrs	4¼ yrs	0	0	Twin bro. 4 4/12 1½ yrs	2 yrs 7 mos	5, 8, 10, 12 & 15 years	2, 8/12 years 2 months	2, 3/12 yrs. 2 mos.	4, 5, 6½ & 8½ years	0	2 yrs	9 mos, 5, 5, 8, 11, 13, 16 & 18 yrs	½, 3, 6, 9, 11, 13, 16, 18, 20 yrs	3½, 6 & 7 yrs
Were others in house ill with other complaints previous to or at time of above patient's illness?	no	no	no	no	no	no	no	Aunt only before another child had impetigo	no	yes twin brother	yes twin brother	no	yes, in other part of house	no	no	yes sister O	no
If patient was an infant was it nursing or bottle fed	✓	✓	✓	✓	✓.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
What parts were paralyzed? –	Right leg	muscles of deglutition	Left hand	Right ankle	none	none	none	none (eyes)	none	Face	arm	Right leg	none	Face	all extremities & chest	none	all limbs
Was there sore throat preceding the paralysis?	no	no	no	no	no	no	no	no	no	no	no	no	yes	no	no	no	no
Was there constipation or diarrhoea preceding the paralysis? –	Diarrhoea	Constipation	Constipation	Constipation	Constipation	Constipation	Constipation	Constipation	Constipation (extreme)	Constipation	Constipation	Constipation	Constipation	Constipation	Diarrhoea before constipation at onset of attack	constipation	?
Was there vomiting? –	yes	yes	not till 3 days then medicine was given	yes	yes	yes	yes – on first day of illness	no	not till 2nd day after fever	no	no	no	no	no	yes	yes	yes
Had patient or members of family (state which) come in direct or indirect contact with patient suffering from this disease	no	no	yes. See history	?	?	yes See H	yes indirectly Winslow case	Had played with F	Playmate of J & K	yes with I	yes with I	Cousin had it	in other part of house at same time	yes, with cases I, J & K	Indirect	yes O & H	yes P & O
Does patient or family know anyone personally who has had this disease in the past –	no	no	yes	no	?	Some abortive case that has been [illegible]	yes E	yes several families	no	yes I	yes I	See above	no	yes	yes	as above	Only P & O
Any domestic animals on premises –	None	no	no	no	Cat	Dog	Dog	no	none	no	no	none	no	no	no	no	Dog
Were any of the animals ill previous to patient's illness –	✓	✓	✓	✓	no	no	no	✓	✓	✓	✓	✓	✓	✓	✓	✓	no
Neighborhood of stable? –	no	none	none	stable several 100 yards away	200 to 300 feet away (stables)	own stable behind house	none	none near	none near	See K	Near stable. Father works with horses most of time	none	none	no	none	Barn – [illegible]	none
Previous health of family this summer? –	good	good	good	good	good	good	good	good	good	good except whooping cough '09	good except as noted in J	Fairly good	Fair to good	good	good	good	Excellent
Health of patient immediately preceding illness? –	good	good	good	good	good	good	good	good	good	Fussy for 3 or 4 days	Fair to good	Fair to good	Fair to good	good	Cranky for 2 weeks before	good	good
Nutrition and diet of patient previous to illness? –	good	Fair to good	Fair to good	good	good	good	good	Fair to good	good	good	Fair to good	Fair to good	Fair to good	good	good	good	good
Detached house, flat, tenement etc.? –	Detached	Detached house	Detached house	Detached	Detached	own detached house	Detached	Detached	Detached	Detached	Detached	Tenement	Tenement	Detached	above butcher shop	Living rooms over butcher shop	over saloon
Recovered or died? –	Recovered	Died	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Died	Recovered	Recovered	Recovered	Recovered
Previous diseases of patient? –	✓	✓	Whooping cough '07	Whooping cough '08	Whooping cough '09	Whooping cough '09 German Measles '08	Whooping cough '09 Measles '09	✓	Whooping cough 1909	Whooping cough '09	Whooping cough 1/09	Scarlet fever Whooping cough	?	✓	Scarlet fever	Small pox '06	"Rheumatism" only

The gastro-intestinal symptoms are secondary to the meningeal irritation. My experience as to sore throat described as a symptom by Wickman in so many of his cases, amounts to no more than a redness which may occur in any case of infectious fever; it has been conspiciously absent, as a rule, in our cases even those having typical spinal paralysis. Keeping in mind the symptoms; such as somnolence, uneasiness, pain in head, neck and along the spine and nerve trunks, together with weakness and slight spastic phenomena, accompanied by fever and vomiting, has enabled us to diagnose a number of cases before paralysis developed, and I believe that we are often justified in diagnosing abortive cases. I will not deny that many cases have been diagnosed as Poliomyelitis which evidently were not, as some physicians seemed to loose sight of other infantile troubles during the period of our epidemic. After careful consideration, however, while one hesitates in openly making a diagnosis of Poliomyelitis without paralysis there seems to be no question that such cases occur, though I am not prepared to state what percentage relationship they assume with regard to the whole number of cases.

Our epidemic began about the first of August and while it was considered as an infectious disease from the beginning there was some doubt whether it should be considered as contagious or not. After the epidemic had been in progress about a fortnight the conclusion was arrived at that contact infection was probable and possibly mediate contagion, so that the reported cases were isolated and quarantined under the same regulations as those for scarlet fever though the period of quarantine was limited to fourteen days. After investigating the hypotheses that the cause of this disease was due to food infection, water, dust, presence of domestic animals and insects, etc., these theories were abandoned as inadequate and we came to the conclusion that the causative agent was a facultative parasite which might lead a saprophytic or saphrozooic existence in the body and that conditions of fatigue or unknown phenomena cause it to change from a feebly virulent agent to one of extreme toxicity. It would seem that the recent brilliant investigations of Flexner on the virus of this disease and its mode of exit from the pharyngeal mucous membranes have justified the actions we took last autumn in treating the disease as contagious and also our views as to the nature of the infectious agent.

Since the recent epidemic of this disease in St. Paul, and throughout the State, our physicians have encountered many atypical cases of Poliomyelitis and the general impression is that the disease is contagious and that clinical observation justifies the status of the abortive type of the disease, though but few of these cases have been reported to the health authorities. The clinical histories and evidences for contagion as given con-concerning the above seventeen cases in a more or less isolated suburb of St. Paul, seems to me to show the contagious nature of the disease. These cases also give a good picture of the clinical symptoms and the abortive form of the disease.

ADDITIONAL OBSERVATIONS ON ACUTE POLIOMYELITIS.*

BY

FRANK E. COULTER, M. D.

Professor of Nervous Diseases, John A. Creighton Medical College; Neurologist to St. Joseph's and Douglas County Hospitals, Omaha, Nebraska.

Acute Poliomyelitis was discussed by the writer before this Society one year ago, but as our own State, as well as the midwest and many other regions, since that time have been visited by quite serious epidemics of the disease, it may not be considered superfluous to again call attention to the subject.

Of all nervous diseases it would seem that acute poliomyelitis has been the subject of more extensive observation and discussion than any other one subject during the past year. It is quite evident from a study of the reports of these recent epidemics, that the old name acute anterior poliomyelitis is inadequate to describe accurately the pathology found present, for our conception of the disease has to some extent been revised. Cadwalader (1) investigated the subject quite thoroughly and stated in his report about one year ago, that the disease was essentially a Polioencephalomeningomyelitis. The truthfulness of this statement from a pathological standpoint, has been abundantly supported by observations made during recent epidemics, and is not only supported by those occurring in our own country, but those encountered elsewhere as well. As the name given by Cadwalader is too lengthy to be euphonious or practicable, excepting as it may be employed to describe the pathological condition, Ball (2) of St. Paul, Minn. suggests that Epidemic Paralysis be substituted. Paul Krause (3) of Bonn also suggests a change of name, and strange to note quite similar to that proposed by Ball excepting that he would prefix the word "acute", making it "Acute Epidemic Paralysis,"—a term worthy of consideration.

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Observation has proven most conclusively that the older text book conception, while fairly accurate in a limited proportion of so-called sporadic cases, should be markedly modified, if intended to describe the epidemic conditions recently encountered. This may be readily understood when one stops to consider that in our own State the recent epidemic represented at least three quite distinct types of the disease; of course some cases were found that embraced points representing various different combinations of the "types" and these combinations were more or less numerous. In other countries even a greater number have been described—as many as eight types being mentioned by Wickman.

The following symptoms are somewhat significant of the three groups, encountered in Nebraska the past year.

(a) There were cases of rapid onset, malaise, fever and chills, at times vomiting, soon followed by paralysis generally of the motor variety, more or less irregularly distributed, but generally confined to areas supplied by the cord. Sensory disturbance was very slight or nil, the sphincters generally escaping (these cases more nearly resembled the old text book picture than any of the others.) In rare instances some of the cranial nerves were involved; after two to five days there was a general amelioration of symptoms and convalescence was established; when bulbar symptoms were added, which occasionally occurred, these cases were grave indeed.

(b) This second class started out much as the first but instead there was added a much more pronounced meningeal picture. Kernig's sign, the tache, and the retracted head and stiffened back muscles were in evidence and the mental condition of these patients was definitely indicative of meningeal involvement, but in no case where the cerebro-spinal fluid was examined was there to be found the meningococcus intracellularis, or any marked alteration from the normal, excepting perhaps a lymphocytosis. This was the type of case that was generally diagnosed cerebro-spinal meningitis. These cases however, were not so long in duration as epidemic cerebro-spinal meningitis, the meningeal picture disappearing as a rule in a few days, and the physician was left in doubt as to just what he encountered.

(c) The third class represented what might be termed the peripheral or neural variety. The onset was much like the others, but instead of the marked central disturbance, with symptoms relating to the cord, or possibly the encephalon, if present at all were but slight, the extremities usually were found to be very tender, and the clinical picture partook more of a multiple neuritic character, and these patients complained much of pain, tenderness and soreness in the muscles upon motion of the extremities, and in rare instances the trunk. In some cases these pains lasted several weeks—one case to the writer's knowledge lasting three weeks, and requiring considerable analgesiac to control, some few cases giving a Babinski response and flaccid paralysis were observed, the picture seemed to be definitely of the meningo-myelitic type but of course these later were only combinations of some of the types already enumerated and were rare.

As these three types all occurred during the same epidemic and in the same communities, it is but fair to suppose they were only different manifestations of the same etiological factor, but acting on different portions of the nervous organization. Gowers refers to this apparently anomalous condition in part when he mentions that a certain proportion of the cases resemble a diffuse myelitis in character, and that another group present the picture of a meningitis more accurately, but that after careful observation and in a short time it will be noted that many of these apparently eratic symptoms subside, leaving the more classical text book picture.

The following condensed abstracts of a few of the most important epidemics occurring recently, may be of interest.

Foreign Reports. A contribution regarding the epidemic of acute infantile paralysis in Westphalia. Paul Krause, (3) 1909.

The literature of previous epidemics is concisely reviewed. The present paper deals with one hundred cases, with nine post-mortems observed, in Hagen and its vicinity since the beginning of June. Two stages characterized respectively by general symptoms and paralysis may be recognized. Gastro-intestinal symptoms were observed in about 90 per cent. at the commencement while, with a single exception, fever and heavy sweating were noticed. Other members of the household were in several instances simultaneously affected. Meningitic symptoms were prominent in two cases. The cerebrospinal fluid was always obtained under pressure, reaching 135 and 140 in two cases, while the cell content was small and consisted almost exclusively of lymphocytes.

A localized meningitis, slight in degree but visible to the naked eye, was present in all the cases examined post-mortem, while without exception the mucous membrane of the whole intestine and particularly the Peyers' patches and follicles were red and swollen. The mesenteric glands were enlarged in all cases, and there was a moderate degree of enlargement of the spleen.

The cases were confined to certain parts of the town, and in several instances it was quite certain that the infection was carried by a healthy person. Some further suggestive remarks in relation to etiolgy are of interest. Concluding that the disease is an infective process, and from his own observations that the active agent obtains entrance by way of the alimentary canal, the author discusses the possibility of infection through articles of diet. It is noteworthy in this connection that a considerable proportion of patients affected were children at the breast. It is interesting to note that there was a great mortality at the same time among chickens at Haspar, a place in which more than twenty cases were observed. A similar observation has been made in Sweden. Another observation by Krause was that several isolated houses in which cases were observed were surrounded by oak trees, the young shoots of which were covered with a white fungus. On inquiry, he ascertained from Professor Stahl in Jena that this disease of the young oak shoots has only existed in Germany for a short time, perhaps only since last year.

Acute epidemic paralysis of children is suggested as a more appropriate title than that in common use,

The 1908 epidemic of poliomyelitis in Vienna and lower Austria. J. Zappert (4). This epidemic began in July, 1908, reached its height September and October, and had almost died out by January of 1909. Data of 266 cases were available for this communication. Boys were more affected than girls in the proportion of 1.34 to 1. Poverty and density of population had apparently very little influence on the distribution. Of Wickman's eight types, the pure spinal form was by far the most common, 241 cases having well marked spinal symptoms. A prodromal stage of one to three days duration was common. Fourteen cases were of the type of Landry's paralysis; they were mostly in rather older children or in young adults, and were all fatal from involvement of the respiratory centers. Pontine and bulbar symptoms were frequently seen in the early stages of the disease, generally associated with spinal symptoms. The encephalitic form was very rare. The ataxic type of Wickman was not seen at all, although ataxia might be present in combination with pontine and bulbar symptoms. The polneuritic type was also lacking, but mild meningitic and abortive types of the disease certainly occurred.

There was no doubt of the infective character of the disease in a good many instances.

Etiology of Epidemic Infantile Paralysis. Paul H. Romer, (5). This important work of Professor Romer takes us one step onwards in the etiology of poliomyelitis. In the recent epidemic in Marburg sore throats were so common that he began cultural experiments from the tonsils and pharynx, but no clue to the existing agent of the disease was found. Bacteriological investigation of the cerebro-spinal fluid and of the brain and cord also proved negative. The results of infecting intra-cerebrally (and intraperitoneally) cerebro-spinal fluid into rabbits, mice and guinea pigs were fruitless and so were the injections of emulsion of brain and cord from an affected case in those animals. But a monkey treated in the same way (intra-cerebral injection of emulsion of poliomyelitic brain and cord) eight days afterwards developed typical poliomyelitis. It died of the disease; emulsions of its cord were injected intra-cerebrally into rabbits but without results, but in another monkey completely typical poliomyelitis developed. The brain and cord substance and cerebro-spinal fluid from these monkeys was sterile so far as ordinary bacterial culture methods went. He concludes that poliomyelitis is therefore in all probability due to some living virus which is present in the brain and cord and can be cultivated in vivo in monkeys; but the organism, whatever it is, does not belong to the group of readily stained and easily cultivated bacteria.

Unusual *frequency* of *poliomyelitis* in France last summer, 1909. Its *identity* with *cases observed* abroad in an *epidemic* form. The relation of *poliomyelitis* to *epidemic cerebro-spinal meningitis*. A. Netter (6). After discussing the pathology symptoms, and epidemiolgy of epidemic poliomyelitis, Netter records six cases which have come under his notice in the course of the last summer. Their ages ranged from two and one-half to nine and one-half years. In one girl, aged seven, who died on the seventh day, microscopical examination of the cord revealed interstital meningomyelitis, especially effecting the anterior coruna. In another patient, in whom the disease resembled Landry's paralysis recovery took place with paralysis and atrophy of the left lower limb. In three cases there was marked nuchal rigidity in the initial stage together with severe pain and paralysis of the sphincters, in a case admitted to hospital with the diagnosis of cerebro-spinal meningitis the onset was also characterized by meningeal symptoms. The paralysis of the lower limbs was of short duration, disappeared without atrophy, and was accompained by violent pains along the course of the nerves. In this instance there appeared to be polneuritis or radiculitis rather than poliomyelitis. In the fifth case paralysis of the limbs was associated with facial paralysis and nystagmus. In the sixth case right hemiplegia and aphasia occurred on the third day and was followed by ataxia of the lower limbs in convalescence.

In three cases lumbar puncture was preformed. In the fatal case clear fluid containing a small number of lymphocytes was obtained on the fifth day. In the second patient, who was also punctured on the fifth day, the fluid was under hypertension, but was clear and contained little albumin, and no microbes or cells. In the third patient slightly turbid fluid was removed on the second day showing numerous polymorphonuclears and organisms resembling meningococci.

Though bacteriology does not allow us to accept the theory of an identical origin for epidemic poliomyelitis and epidemic cerebro-spinal meningitis, certain arguments in favor of this idenity have been adduced, among which are the frequent affection of the pia and occurrance of sequelae indicating involvement of the higher nerve centres in poliomyelitis. Even the character of the cerebro-spinal fluid is not decisive. Netter has frequently shown (review of N. & P., 1909, p. 606) that though the fluid in epidemic cerebro-spinal meningitis is usually turbid and rich in polymorphonuclears it may some times be clear and contain lymphocytes only.

It is further to be noted that epidemics of poliomyelitis usually bears chronological relation to epidemics of cerebro-spinal meningitis. This has been exemplified not only in France but also in the United States, Holland and Scandinavia, where there has recently been a co-existence of the two epidemics.

The *early stages* of Infantile Paralysis. E. Muller (7). This paper is based on the study of fifty cases by Professor Muller of Marburg in the recent epidemic of poliomyelitis in Hesse-Nassau. The disease, as Wickman had found, showed a predilection for certain villages, streets, and groups of houses. There was no evidence to show that infection was conveyed through food or vermin but it was apparently transmitted from person to person, and frequently by healthy "carriers." The incubation period was at least five days, and, as a rule, about a week. Intestinal symptoms, were exceptional in Muller's experience. Very frequently there was initial angina, bronchitis, or even bronco-pneumonia. Very many cases occurred in which there was no definite paralysis. Often there was only loss of the tendon reflexes or muscular hypotonus without coarse paresis. A striking instance of the co-existence of abortive and fulminating cases in the same family occurred in the case of a mother and her child, who were both taken ill with angina. The mother rapidly recovered but the child died with signs of Landry's paralysis. In spite of the great variety of the prodromal symtoms Muller thinks it is possible to make a correct diagnosis before the appearance of paralysis, from the pressure of three cardinal symptoms, *profuse perspiration, hyeraesthesia*, and *leucopenia.* Other important symptoms were weakness of the abdominal muscles, meteorism, and the loss of the abdominal reflex. He often found a disproportion between severity of the initial symptoms and the subsequent paralysis, a violent onset being followed by an almost complete absence of palsy, and vice versa. Severe meningeal symptoms especially nuchal and vertebral rigidity, were rare, as were also convulsions, delirium and loss of consciousness. Pontine and bulbar pneumonia were frequent. Herpes was rare, but other eruptions were often seen. Lumbar punctures always showed a clear fluid under hypertension, with lymphocytes, but without any microbes in the sediment. Muller is convinced that the virus enters the system through the respiratory and intestinal tracts, and thinks it possible that, like that of rabies, it passes along the nerve lympathics into the spinal subarchnoid space, and thence along the lymph sheaths of the spinal vessels, especially those of the central arteries.

Infantile *Paralysis* in Rhenish Westphalia, Reckseh, (8). The epidemic of the cerebro-spinal meningitis in Rhenish Westphalia had hardly subsided when an outbreak of acute poliomyelitis occurred in several districts. The epidemic rapidly spread so that by November there were five hundred cases. In the Arnsberg district the disease was made noticable. Faucial inflammation was an initial symptom in many cases, and during the first few days of the disease many patients sufferred from Nuchal rigidity, headache, and convulsions. Intestinal symptoms, such as constipation or diarrhea, were often present in the early stage. It is thus obvious that an accurate diagnosis usually is impossible during the onset, as there was nothing to indicate a spinal affection. The blood, as in typhoid fever, showed a diminution of the white cells, with a relative increase of the lymphocytes. The cells in the cerebro-spinal fluid were scanty and almost exclusively lymphocytes. Of ninety-three cases in the Bochum district, seventeen died—a mortality of 15.2 per cent. The care required in prognosis is illustrated by the following case:

A girl, aged eight years, after a mild prodomal stage developed flaccid palsy of both legs. Her general condition was excellent, and all the organs, especially the heart, appeared healthy, when without any warning, death suddenly occurred on the second day, being probably due to action of the toxins on the heart muscle.

Experimental *investigation* on *Acute Poliomyelitis.* Leiner and R. V. Wiesner, (9).

The writers found intracranial inoculation more certain than intraperitoneal, especially in carrying on the disease from one monkey to another. Young animals were found better than adults of the same species. There appeared to be no change in the virulence or incubation period in transference through several generations of monkeys, the incubation period varying between six and ten days. They did not succeed in transmitting the disease by inoculation of cerebro-spinal fluid, blood or spleen juice. The virus seemed to be removed by passage of the emulsion through a filter, but on this point further observations are required.

In animals the onset of the disease is usually sudden, but without fever; the extension of the paralysis is rapid. Types analogous to those found in men occurred, viz. purely spinal cases, spinal paralysis associated with peripheral paralysis, and bulbar cases. They failed in attempts to transmit the disease to animals other than the lower monkeys. They regard the various cocci which have been found by different authors in this disease as accidental impurities.

U. S. Reports. *Infantile Paralysis.* H. Davis, (10.) The recent epidemic of two hundred cases in St. Paul occurred during the period of greatest summer heat. In more than half the cases stomach or bowel troubles preceded the paralysis. Nuchal rigidity occurred in all the severe and in many of the mild cases. Neuritic pains were constant and severe. One quarter of the cases had ocular or facial paralysis. Most of the cases of leg palsy had paralysis of the upper limbs and of the bladder as well. All the deaths which Davis had seen were due to respiratory paralysis. There were some extremely mild cases, whose only symproms were slight digestive troubles, apathy, somnolence, and pain on movement in the arms and legs, and who recovered without paralysis in from three to six days.

The new disease, Infantile Paralysis. C. R. Ball, (11.) Ball suggests epidemic paralysis as a name for the disease hitherto known as infantile epidemic paralysis or acute anterior poliomyelitis. The term infantile paralysis is unsuitable, because the disease in an epidemic form frequently attacks older children and adults, in whom it is more severe than in infants, while the term anterior poliomyelitis is too narrow for a disease presenting so many different types. Ball records seven atypical cases, three of which ran a fulminany course, death from respiratory paralysis taking place within a few days of the onset. In two babies the disease was manifested by the occurrence of facial paralysis, associated in one case with paralysis of the external rectus of the opposite side. In a girl, aged 17 years, the right sixth nerve was the only one involved. The last case was that of a woman, aged 38, who had no paralysis, but only severe headache and pain in the back of the neck. Ball found that abortive cases were very frequent during the epidemics, and thinks that many such cases are not seen by doctors at all. According to him the text books are wrong in stating that the sphincters are not involved, since he met with many cases of retention in which catheterization was necessary for several days. Pain and tenderness along the affected nerve trunks, he considers, are much greater than has been taught, but whereas in multiple neuritis the tenderness is most marked in the distal parts, in epidemic paralysis the proximal parts are most affected. As regards treatment, absolute rest in bed is most important, and should be enforced, even in mild cases, for several weeks. In the fatal cases the patients took a varying degree of exercise after the onset of the disease.

It will be many years no doubt before any discussion of acute poliomyelitis will be considered complete unless reference be made to the New York report of the epidemic of 1907. This report has just been published and consists of a monograph of about 125 pages. The entire committee engaged in this arduous task consisted of seven members from the New York Neurological Society and three members of the Pediatric Section of New York Academy of Medicine, and to this was added Dr. S. Flexner of the Rockefeller Institute, and Dr. Charles Baldnan and Dr. H. L. Taylor of the health department of New York City. On organization Dr. Sachs was chosen chairman and Dr. Zabriskie secretary.

The first work of this committee was to send out cards to all physicians in the territory invaded by the epidemic to learn how many had had such cases occurring in their practice. Then to all answering in the affirmative a very extensive and comprehensive history sheet was mailed, which when filled out was to be returned to the secretary of the committee. To make the work more thorough and complete five sub-committees were arranged from the general numbers. Sub-committee No. 1 had charge of the subject Epidemology. No. 2 investigated the conditions preceeding onset and the early symptoms of the disease. No. 3 investigated the symptomatology of the epidemic. No. 4 the pathology and pathological anatomy, and No. 5 made special investigation and suggestion for treatment.

The findings of these various committees are most interesting to any one at all desirous of studying the subject, and in short, the writer would urge all wishing the most recent information on the subject to secure a copy of the report.

In a paper such as this the report is of course too voluminous to give anything but a few of the conclusions reached, but it is worthy of most careful study and deliberate consideration. The conclusions of sub-committee No. 1 (epidemiology) is as follows:

The 1907 epidemic of poliomyelitis centered in New York City where some 2,500 cases of the disease occurred.

The epidemic spread rapidly, along ordinary routes of travel, and appeared in Boston and other points in Massachusetts.

In New York City an unusual proportion of cases occurred on the east side of Manhattan Borough. The reason for this is not known.

It was impossible to discover any susceptibility to the disease according to the nativity in the cases reported. The very few (2 out of 750) cases among negroes is remarkable. An unusually large proportion of cases occurred in young children.

In the city the epidemic began in June and reached its height in September, the onset of the country cases was generally somewhat later, and the proportion developing in September greater than in the city cases.

The disease was moderately communicable; about as much so as epidemic cerebro-spinal meningitis. The path of infection could not be determined.

A number of medical men throughout the United States have reported the occurrence of the disease in horses. Krause of Bonn reports the occurrence of a paralytic affection in chickens.

The disease was distinctly less virulent in the New York epidemic than in other epidemics. This is shown by the low mortality and by the small number of adults affected.

The data on the probable average incubation period are too meager to permit of definite conclusions, though the evidence indicates an average incubation of less than ten days.

Sub-committee No. 2 and No. 3 formulate no conclusions and their report must be studied in detail if one wishes to appreciate all their findings.

Sub-committee No. 4 (pathology and pathological anatomy) was composed of Drs. Flexner and Strauss. The former making a report of the experimental work done on monkeys at the laboratories of the Rockefeller Institute. A most complete resume of which will be found in Experimental Medicine, Vol. XII—No. 2—1910, also the Journal of the A. M. A. 1910. LIV-535. In summing up, Dr. Flexner's conclusions are as follows:

The experimental study of poliomyelitis has yielded a large number of important facts relating to the spontaneous disease in man. The nature of the virus has been discovered, many of its properties have been ascertained, the clinical pathological peculiarities of the disease have been elucidated and a basis has been secured on which to develop a measure of prevention.

Conclusions.

1. Acute poliomyelitis is an infectious disease.

2. A disease similar to acute poliomyelitis in man can be produced by inoculation of the human cord into monkeys. Successful inoculations follow injections of emulsions of the human cord into the cranial subdural space or into the peritoneal cavity.

3. Re-inoculation from monkey to monkey is possible and apparently may be kept up indefinitely. These inoculations may be subdural, intravenous, into the nerve sheaths, and intraperitoneal. The last method is shown to be the most unreliable, the first route of infection is probably the surest.

4. The virus resides in the brain as well as in the cord.

5. The cerebro-spinal fluid of acute cases does not contain the virus in an infective state at least for monkeys and the reported bacterial findings in the cerebro-spinal fluid are either contaminations or secondary invaders.

6. When paralysis is present the virus lies in the cord and brain for both of which it has a special affinity and is probably no longer present in the blood or at least is not in such a state as to produce infection in the monkey.

7. Histologically the lesion in poliomyelitis is very similar to that in human rabies. Moreover, the manner in which the monkey is effected is identical with the route of infection used in the production of experimental rabies. Further, there occurs a type of ascending paralysis in rabies which is clinically

identical with that of acute poliomyelities and can only be differentiated from the latter by animal inoculation of the cord or brain. These facts point to a possible analogy between the infective agents in both conditions, and a possible means of immunization.

8. The virus is probably not bacterial but may possibly be of protozoan nature.

9. Since the disease is only positively recognizable with the onset of the paralysis, attempts at immunization must be directed toward lessening the spread of the disease in the central nervous system and to offset the toxic action on the ganglion cells in as early a period as possible.

Those of us who have followed the most excellent work of Dr. Flexner are proud of the fact that he belongs on this side of the Atlantic and does his work in an institution in our own country.

Dr. Strauss who is connected with the Mt. Sinai Hospital laboratories as well as those of the Cornell Medical School bases his conclusions on the findings of eight cases occurring during the epidemic of 1907, and during the summer of 1909. They are as follows:

1. There are changes in both the interstitial and parenchymatous tissues, but the interstitial are of fundamental importance and the latter are secondary to them.

2. The ganglion cells are effected only secondarily and when in contact with the inflammatory process around the vessels.

3. The interstitial process is dependent upon its relation to the vessels for its character and its localization.

4. While the lesions are most marked in the anterior horns of the cord it is not confined to that portion of the gray matter, and hence, the word "anterior" should not be used to designate the disease.

5. The white matter of the cord is the seat of inflammatory changes of minor importance.

6. The pia infiltration is an essential element in the pathological process.

7. The involvement of the medulla, pons and basal ganglia always occurs in the fatal cases, though clincial experience in the later epidemics has shown that such involvement does not necessarily mean a fatal prognosis.

8. The ganglion cells in the medulla, pons and basal ganglia generally escape serious morphological alteration even when they lie near foci infiltrated tissue. This condition is in striking contrast to what occurs in the spinal cord.

9. The brain cortex may show evidences of vascular irritation and some times of cellular infiltration.

10. The edema which is present in both white and gray matter is an important factor in producing the paralysis and explains to a large extent the transitory character of the symptoms on the cases which survive.

11. The predominating role which has been ascribed to the central artery of the spinal cord by previous observers is unjustifiable. The central vein in the same region has an active part in the production of the lesion, and it is proven now that the other vessels of the cord also transmit the virus and take part in the production of the lesion.

12. There is no evidence of thombosis which has been considered by some to be the cause of the pathological condition in this disease.

13. Apparently the infective agent may effect any part of the central nervous system.

14. It is difficult to determine absolutely from a study of the pathological histology whether the infection is of hematogenic or lymphogenic origin.

15. Wickman, Harges and Schaffer have shown that the histological picture in the cord of a case of rabies is almost identical with that observed in acute poliomyelitis. Further, my study has shown a similarity between the affection of the spinal ganglia in the two conditions. The similarity and mode of infection employed in the production of experimental rabies and experimental poliomyelitis is another fact of considerable significance as pointing to the possible similarity in the virus of the two conditions.

One of the most important questions next to the prevention of this malady is that of the treatment. On this point, the report of the sub-committee is of much interest, not that the treatment reported by the various observers was of much importance for it was not, but the sub-committee formulated a line of treatment that seems to the writer to be most serviceable as well as rational. It is devided into two classes that is applicable to both the early and later stages. At the onset elimination by the bowels is of much importance and for this purpose, calomel or olium riceni, followed by Rochelle salts, and if necessary an enema is most serviceable. Retention of urine is not to be overlooked, and the diet liquid and simple. In case of high temperature and pain in head or neck the ice cap is to be applied, also in early period to reduce temperature and relieve soreness, the warm bath is urgently recommended, sponging some times is quite serviceable. The bath promotes sleep and if properly administered relieves much of the rigidity found in the meningeal and soreness in the peripheral cases. The temperature of the bath should be about 100 and care be taken to see that it remains at that point, ten or fifteen minutes is usually long enough for the application, and the child should be immersed during the time, and upon his removal he should be wrapped in a warm blanket, care being taken to see that he is not chilled. Should the temperature not be reduced by the bath, small doses of antipyretics may be used.

For the pain the bromides, phenacetine, antipyrine, codine or chloral is mentioned; of course no specific treatment for the inflammation of the cord has yet been found.

Early in the course of the disease counter-irritation, by the use of a long mustard plaster along the spine is good, and we would add also the application of tinc. iodine is of benefit. Lumbar puncture is advisable in those cases with marked meningeal symptoms.

After the subsidence of the acute stage and when paralysis has made its appearance other procedures are to be inaugurated. Much care should be taken to prevent the formation of bed sores, the limbs should be carefully arranged so that a deformity does not appear and if the paralyzed limbs be found cold they should be kept warm by artificial means if necessary.

Electricity should not be used until the acute symptoms have subsided, but massage and passive movements may be used much eariler if done carefully and not for too long a time. As soon as voluntary movements can be made they should be encouraged, at first of course limited in range and force but gradually and carefully increased as progress is made and time passes. The voluntary effort may be first inaugruated by the assistance of electricity and then this artificial stimulant may be discountinued for volition is the best stimulant if found available. It is surprising the great improvement that is made in some of those cases when carefully and systematically treated upon the lines just mentioned.

Should deformities be present after careful and persistent effort to correct the same by physiological and mechanical means, then surgical procedure should be resorted to for their management.

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A CONTRIBUTION TO THE STUDY OF ACUTE POLIOMYELITIS BASED ON THE OBSERVATION OF THIRTY-EIGHT RECENT CASES WITH TWO AUTOPSIES.*

BY

COLIN K. RUSSEL, M. D.

Neurologist to the Royal Victoria Hospital, Montreal.

While we recognize that it will be impossible to add to the description of acute poliomyelitis in its epidemic form as given by Wickman,[1] in 1905, and Harbitz and Scheel,[2] in 1907, of the great epidemics in Norway and Sweden which occurred in the years between 1903 and 1906, it may be of interest to compare the disease as it appeared in Montreal in the epidemic of the summer and autumn of 1909.

Wickman and his colleagues worked out the details of four epidemics, one of them consisting of over a thousand cases with a mortality of 13.1 per cent. Within the last three years severe epidemics have occurred in New York, in 1907,[3] consisting of about 2,500 cases, and again in the summer of 1908,[4] when about 1,200 cases developed. In Victoria, Australia, in the autumn months of 1907, Dr. Stevens[5] analyzed 135 recent cases. In Massachusetts, during the summer of 1908, Lovett[6] and Emerson[7] gathered together 234 cases. In Salem, Virginia, Wiley[8] and Dardem reported 25 cases of an epidemic which occurred the same summer.

Vienna and lower Austria suffered from a similar epidemic in 1908, when Zappert[9] found data from 266 cases available. Epidemics of moderate severity have been reported as having occurred this past summer in Marburg[10] and also in Westphalia[11]. It is interesting to notice also that there has been an unusual frequency of poliomyelitis reported in France[12] during the past summer.

I may say that I have been led to the same conclusion as these authors as regards terminology. Acute *anterior* poliomyelitis is a misnomer, as the disease is far more widespread than this term implies; it is really an acute meningo-poliomyelitis and may be encephalitis.

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*Read before the Canadian Medical Association, June 1st,to 4th, 1910.

It is impossible in the absence of Government recognition, where the notification of the cases as they occur is not compulsory, to speak of the epidemic as a whole. It is even more impossible to form an idea on the causation of such an epidemic without a systematic examination into the surroundings of every case. That the expense to the Government of such a systematic study would be justifiable one can judge from the following report, including as it does only cases which have come under my own personal observation in the neurological department of the Royal Victoria Hospital and in my private practice, between July 1st and December 31st, 1909.

I have seen an all thirty-eight cases, twenty-six of which occurred within the city limits, three other cases occurred on the Island, two at Ahuntsic, and one at Highlands, one came from the Laurentian Mountains, one from St. Hubert, Chambly Co., one from Ottawa, one from Brownsburg, P. Q., one from Stanbridge East, one from East Hatley, and one from Halifax. It must be remembered that this does not include those patients who were treated at the Montreal General or the Western, the Hotel Dieu or the Notre Dame Hospitals, or who were treated by their own physicians. In reply to a circular sent to the Montreal physicians I have notes of many of these, and I hope at a later date, in conjunction with my colleague Dr. Shirres, to be able to give a fuller, although still necessarily an incomplete account, of the number of cases that occurred in the city during the summer. I may say, for the purposes of comparison, that previous to July, 1909, we have only had two sporadic cases treated in the Hospital or the Out Door Clinic since 1906.

The age of the patients varied from three months to forty two years; 60 per cent., however, were only three years old or younger. Tabulated they are as follows:

25	were between the ages of		....	1	and	5
8	" "	"	....	6	"	10
1	case was "	"	....	11	"	15
1	" "	"	....	21	"	25

2 were the ages of .... 36 and 40
1 was " " .... 40 " 45

The distribution according to sex was practically equal, there being 18 females and 20 males affected. The nationality of the individual apparently played no part, there being 50 per cent. English speaking, and 31.64 per cent. French speaking patients among those affected; 12.82 per cent. were Hebrews, while Italians and Russians each contributed 2.63 per cent. of the total number. This is, I think, approximately about the proportion of the different nationalities seen at the clinic.

The greater number of cases occurred in August and September. Classified according to the month in which they occurred they are as follows:—

July..................	4	September........	13
August...............	12	October..........	9

There is no doubt that the disease is an infection, but the infectibility must be very slight, as in nearly every case there were one or more other children in the same house, and in no case of this series was more than one affected. We all know of course, that cases have occurred where several members of a household have been affected, and cases are reported where the infection has apparently been carried by a third person who has himself not suffered from the disease, but these cases are relatively seldom. In two cases there has been rather a strange coincidence. In one, the child about two years old, developed a paralysis of the left deltoid muscle; the father has a precisely similar paralysis of the same muscle which he developed in infancy. In the second case, also a child with paralysis of the deltoid, a brother had a similar localized paralysis which had developed one year previously. Practically all the cases in the city have developed in the overcrowded districts to the east and south where cleaniness is uncommon, although a few have come from amidst apparently clean surroundings.

In the majority of cases the disease was preceeded by certain prodromal symptoms which lasted on an average a little over two days before the onset of the paralysis. It is true that, in five cases, the paralysis developed suddenly while the child was playing and apparently in its usual good health.

In others the prodromata were present for six or twelve hours before the onset of the paralysis; in others, again, it was as long as five to seven days after the onset of the prodromal symptoms that the paralysis of the limbs appeared.

As a general rule the patient complains of a little indefinite general malaise, has some headache, and may vomit once or twice. The bowels are usually constipated, but in a few cases there has been diarrhea. Some indefinite gastro-intestinal disturbance so common in children is suggested, especially as the fever is only slight as a rule; but if the child be old enough to make a complaint, or if in younger ones the limbs be moved, there is immediately evidence of pain and tenderness in one or other or perhaps all the extremities, which should suggest something more than the ordinary gastro-intestinal condition of infancy. In about 30 per cent. of the cases there has been a history of more or less marked clinical signs of meningitis; in only three cases were there convulsions.

Ever since the time of Mephibosheth, the son of Jonathan, of whom it is reported that at the age of five years his nurse let him fall from her arms, and from that time he was not able to walk, we have frequently the history of a preceding accident to which the patients attribute the onset of the paralysis. A similar history has been given in a few of our cases, but in none did it seem possible to connect it as the causative factor. In two the fall was of such a slight nature that it seemed far more likely to be the result rather than the cause of the paralysis. As a rule, the paralysis at its onset is at its height, but in some cases there has been a spread of the disease quite similar to what one sees in the so-called Landry's paralysis. Both of the cases, whose clinical histories with autopsy findings will be reported later, are examples of this. In both cases the cause of death was due to final involvement of the respiratory centres.

The *spinal form* of the disease was by far the most common. At the onset at the height of the paralysis, all extremities were powerless in nine cases, both legs were affected in twelve; both arms alone in only one; one leg was alone affected in four; and one arm alone in six. Both legs and one arm were picked out in one case, and one leg and one arm in two cases, in one of which they were on opposite sides of the body.

The *pons and medulla* were affected in three cases, the face alone being paralyzed in two cases; in the third not only was the left side of the face paralyzed, but there was oculo-motor and motor paralysis of the fifth nerve, with the consequent strabismus and ptosis, and inability to close the jaws; the patient, a child of two and-a-half years, could not protrude the tongue. This was later associated with a spastic paralysis of the right arm and leg, showing a spread of the lesion and the involvement of the upper motor neurones to the limbs of the opposite side of the body. This child eventually made a good recovery.

In three cases, while one could hardly call them *abortive*, still the lesion was evidently of a less serious nature, as the muscles never lost their reaction to the Faradic current, and there was a perfect return of function in the course of six weeks. One of these cases was a man of 42, in whom both legs were completely paralyzed; another was in a man of 37, in whom the anterior tibial groups of muscles were picked out, and the third was a girl of nine, in whom the left side of the face and some of the ocular muscles were paralyzed.

There was retention of urine for from one to two days in only three cases. In the majority of cases there was a marked and rapid improvement in the extent of the paralysis in the first ten days. In one case, for example, where all extremities were paralyzed for a week, the right arm was the only one which remained paralyzed, and in another similar case the right leg alone remained affected. In three cases where the whole arm had been affected the deltoid was the only muscle that did not regain its function. The muscles of the hands and feet were not in any case completely and permanently paralyzed.

The tenderness on movement of the affected limb was severe in every case, and remained present for several weeks in many; in one case, indeed, the spontaneous pain and later the excessive tenderness with rapid atrophy of the muscles suggested an associated *neuritis*. There was definite impairment of sensibility observed in a few cases.

After the first two weeks the improvement is very much slower and dependent to much greater extent on the care and treatment received; contractures are apt to occur in muscles retaining some power where they are unopposed, their antagonist being paralyzed at least temporarily. This, if left alone, goes on rapidly to deformity and prevents the return of function in the paralyzed group even if the nerve centres do recover. On the whole it has been a pleasant surprise to me and my colleagues in the Neurological Clinic, judging from the prognosis given in the usual text books, to see how much recovery has taken place in the course of two or three months' treatment in cases where the electrical reactions gave anything but a good prognosis.

The following is the clinical history and the autopsy findings in two cases:—

*Case I.**—The following is from Dr. McCrae's notes—E. aged 24 single, engineer; admitted complaining of weakness, loss of appetite, pain in the right hip, and inability to use the hands; seven days previously he had developed a sore throat but worked till the second day before admission. On this day he went to bed. For these seven days he complained of headache, at first frontal and occipital, and finally the pain was in the neck. The day before admission he vomited thrice, was constipated and reported difficulty in thinking and on the day of admission had dyspnoea on lying down. His previous history is uneventful, save for a severe attack of neurasthenia at the age of 16, for which he had several months treatment.

On admission to the Royal Victoria Hospital at noon, his temperature was 99, his pulse 76. He could not hold a cup in his hand. His breathing was jerky and abdominal; his pupils reacted to light and accommodation; there was no nystagmus, the fields of vision were normal. The throat was clear, some pain was complained of in throwing the head forward. Dermatographia was marked; there was no tenderness of the spine or hips; the abdominal reflexes were equal and active.

The grip of the hands was weak and they were held semiflexed; the wrist and elbow reflexes were not obtained, knee jerks were lessened, Kernig's sign was 135 degrees on both sides, ankle jerks not obtained, no Babinski's phenomenon. All movements of the legs were normal except raising the extended limb, which was done weakly and with tremor. Sensation to rough tests was normal. About 3 p. m. temperature was 99, the pulse 76; the dyspnoea had increased, the acessory muscles of respiration being used.

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*These two cases have already been published in a less detailed preliminary report, *Montreal Medical Journal*, December, 1909.

At 7 p. m., when he was seen by the writer in consultation, the condition was as described above. The respirations were about 65 and abdominal in type, the temperature 99, the pulse 56. In spite of the extreme dyspnoea the acessory muscles of respiration were not in action, at the same time the patient could use the sterno-mastoids to some extent voluntarily in turning the head on the pillow.

The left knee jerk was obtained but weakly. The muscles all contracted well to mechanical stimulation, for instance, when struck with a percussion hammer, and showed a condition of myoedema; that is, when they were struck or pinched, a slow localized contraction of the muscle took place, giving rise to a small ridge which disappeared again in 20 to 30 seconds. The muscles all reacted well to Faradism. At midnight the patient's temperature rose to 100 3-5 and the pulse was 76. Cerebration was apparently quite clear. He died suddenly at 3 a. m. of respiratory failure. At autopsy, which was performed eight hours after death, the following conditions were noted:

The skull was of moderate thickness. The dura was firmly adherent to the vertex, the sinuses free. The pia over the vertex was cloudy with one small, quite thickened and white area on the left hemisphere about the middle, close to the longitudinal sinus and in the immediate anterior extremity of the right frontal lobe was another; each measured about 5 mm. in diameter. The superficial vessels of the vertex were slightly congested. The pia over the base appeared normal, but there was more marked congestion of the vessels over the brain stem. There was no thickening of the pia on the superior surface of the cerebellum. The brain weighed 1,525 gms.

Cord: The spinal dura appeared normal. On palpation the cord at the lumbar enlargement was hard and felt like a lead pencil. In the dorsal region this was not so noticeable; but in the upper part of the cervical region the same hardness could be felt through the dura. On opening the dura there was no particular congestion of the vessels of the anterior surface of the cord, while those of the posterior surface were slightly so, especially in the lumbar region and over the cervical enlargement. On the posterior surface there were numerous irregular shaped, hard, pearly white, plaques of cartilaginous hardness. There was a slight tendency, especially in the lower dorsal and lumbar regions, to a wrinkled appearance in a transverse direction, as if a fine thread had been wound tightly and irregularly around the cord; this was thought to be due to the edema of the cord. On section in the lumbar region there was a moderate amount of eversion of the edges of the cord, and there was apparent to the naked eye a softening of the anterior horn on the left side. In the dorsal region this eversion of the edges, on section was even more marked and the gray matter was softened and indistinctly demarcated. There was a visible congestion of the vessels of the gray matter of the cord in this region.

The spleen was enlarged and the lymphoid tissue strikingly prominent. There was also acute hemorrhagic nephritis.

Microscopical examination gives the following findings:

First Sacral Segment: The meninges show a marked round-celled infiltration chiefly in the neighborhood of the anterior spinal artery and penetrating into the anterior fissure along with the vessel; but it is present also on the posterior aspect of the cord. The spinal vessels are markedly congested, and there is an excessive perivascular lymphocytic exudation. There is no evidence of thrombosis in any of the vessels. In the substance of the cord the vessels are dilated and congested generally, not only in the region of the gray matter but in the lateral and posterior columns as well. They are in every case surrounded by numerous round cells, mostly lymphocytes; and there are also a great many plasma cells amongst these. A few ganglion cells still exist with a fairly normal outline, especially in the lateral nuclei. Apart from these there may be seen cells in various stages of destruction, some large and swollen, staining poorly with the nucleus almost extruded, others small and shrunken staining deeply, with no nucleus visible, others again scarcely visible on account of the numerous small round cells that encompass them, evidently the final stage in their disappearance.

Second Lumbar Segment: The same infiltration of the meninges is present as in the former section, especially evident around the vessels. There is very marked generalized congestion of all the vessels in the cord substance with perivascular exudation. This is more evident in the anterior horns on account of the better vascular supply, but the individual vessels of the posterior columns of the cord show an exactly similar condition. There has been a rupture of a small vessel in the right anterior horn with a small hemorrhagic extravasation. Throughout the section there is the same round-celled infiltration, chiefly lymphocytes, with polymorpho-nuclears, and a good many large plasma cells. This infiltration is most marked in the gray matter of both the anterior and posterior horns and the white matter immediately surrounding this. The ground substance of the cord has a rarified appearance with dilated meshes due to the odema present. No nerve cells can be discovered, only occasional clumps of white cells show the last stages in their disappearance.

Ninth Dorsal Segment: The same infiltration of the meninges is present although perhaps less marked than in the lumbo-sacral region. The cord substance has the same edematous appearance and shows the same general leucocytic infiltration of the gray matter of the anterior and posterior horns and the white matter immediately surrounding, although this also is not so marked as in the previous sections. The same extensive perivascular exudation is present. Not a nerve cell can be found at this level of the cord save three in Clark's column on the right side and as there are no collections of leucocytes, as in the former sections, marking the final demolition of the cells, this has evidently already taken place.

Sixth Dorsal Segment: Is practically the same as the former section.

Eighth Cervical Segment: At this level there is the same evidence of meningitis as in the other sections, and here, also, the nerve roots do not appear to be involved. There is the same intense congestion of all the vessels in every part of the cord with the perivascular exudation. There is the same general infiltration of round cells in the gray matter of both the anterior and posterior horns and the surrounding white matter and the utter absence of any nerve cells.

Fourth Cervical Segment: Shows the same picture.

Lower Medulla: Here we see the same evidence of meningitis, but it is even more intense than in the lower levels of the cord, and the same general congestion and perivascular exudation of lymphocytes and numerous plasma cells. There is also a fairly well marked general round-celled infiltration of the gray matter, but there are numerous nerve cells still remaining in a good state of repair, here and there one sees in the gray matter clumps of leucocytes which probably represent the final stage in the destruction of some cell, but as a general thing the nerve cells appear normal.

Medulla at the level of the 9th *Nucleus*: The infiltration of the meninges is less marked than lower down, though it is present to a slight extent. One sees the same congestion of the vessels and the perivascular exudation of leucocytes, which is most marked in the formatio reticularis. There is also a certain amount of generalized round-celled infiltration in the reticular portion though the nerve cells do not appear to be affected.

Pons, Level of the 4*th Nucleus*: The vessels of the formatio reticularis are here also congested and surrounded by numerous leucocytes. The nerve cells of the nucleus stain well and appear normal.

At the level of the 3rd nucleus the same thing is visible.

Sections of the optic thalamus and of the left centrum ovale show nothing abnormal.

Sections of the left frontal cortex show slight infiltration of the meninges beyond which there is nothing abnormal.

The bacteriological examination, for which I am indebted to Drs. Tytler and Klotz, is as follows:

At autopsy cultures were made from (1) the heart's blood, (2) pericardial fluid, (3) liver juice, (4) spleen juice and (5) cerebro-spinal fluid.

At the same time smears were made from the various fluids collected and were examined in stained specimens. Organisms were found in the heart's blood, pericardial fluid and cerebrospinal fluid. The organisms from the different regions were alike morphologically, but were most abundant in the cerebrospinal fluid. These organisms appeared as cocci, occurring in pairs and occasionally in tetrads. A few were flattened but most of the organisms were spherical. The majority of the organisms were decolorized by Gram's method, but some resisted decolorization after the nuclei of the leucocytes were decolorized. The cerebrospinal fluid was distinctly cloudy and showed a large excess of leucocytes.

Cultural: Organisms were found in the cultures taken from (1) the heart's blood, (2) pericardial fluid, (3) liver juice and (4) cerebrospinal fluid. No growth was obtained on any of the media on the first day. On the second day a growth appeared in plain serum water in all inoculations save those of the spleen juice.

Organisms could also be found on blood serum and blood agar media although there was no macroscopic evidence of growth. Organisms were also found in the sediment of the dextrose broth tubes. Transfers made from the inoculated media to new tubes proved unsuccessful, save where serum water was used. In this latter medium three generations of the organism were obtained, but at the end of a week no further transfers grew on freshly inoculated media.

The organisms which were obtained in the cultures were morphologically similar to those noted in the direct smears. Most commonly the cocci were seen in pairs and not infrequently the individuals were much flattened towards each other. Here and there tetrads were noted. As a rule the organisms were larger than those seen in the direct smears.

The organisms stained well with the ordinary stains and with Gram's method were decolorized with some difficulty. It was found that after decolorizing five minutes some of the organisms still remained positive, while many had given up the stain.

Case II.—G. E., a well developed boy of 10 years, had been spending the summer with his parents among the Laurentian lakes, and previous to the onset of the present illness had enjoyed perfect health. Early on the morning of August 5th, he complained of headache, and his mother noticed that his breathing was more rapid than usual. He had spent some time the previous day, which had been very hot, swimming, and then lying out on the roof of the cottage in the sun where there was a little breeze. Just before sunset he and some friends paddled some considerable distance down the lake, but on the way back after sunset he did not paddle but lay in the bottom of the boat. He was scantily clad in the light clothes he had worn during the heat of the day, and on being questioned said that his feet were cold. The pain in his head and the back of the neck continued during the day of August 5th. His temperature was 100° F., and he would take no nourishment. The following day he had developed flaccid paralysis of the lower extremities with loss of reflexes; the arms, later in the day also became paralyzed, especially the left. Beyond the pain in the head and neck he did not suffer and his mind was clear, respirations still very rapid, but the temperature had fallen to normal and he took some light nourishment. The next day there appeared to be some improvement in the arms but otherwise no change from this on, except that the respirations became more and more difficult. When he was seen by Dr. Fraser Gurd for the first time on the fifth day of the disease there was paralysis of the intercostals and the diaphragm; life was dependent on the extraordinary muscles of respiration only, and, as was expected, the patient died that night of respiratory failure.

The autopsy was performed at the home of the parents 10 hours after death. The brain cord were removed, the other viscera could only be examined *in situ*, and showed no abnormality. There was nothing to be noted about the calvarium, the dura was of normal color and glistening; there was no congestion either over the cord or brain.

On removal the brain looked large for the size of the head, and it weighed 1,550 gms. The superficial vessels were not particularly engorged, but the surface of the brain had a peculiar slightly bluish gray color; on section the edges evert showing the capillaries of the cortex somewhat engorged in places.

Cord: The dura was covered posteriorly with a thick layer of fat. The dura itself was healthy and glistening. On palpation through the dura the cord felt extremely hard, especially over the lumbar and dorsal regions. On opening the dura the vessels of the pia-arachnoid were slightly congested. The whole cord from the lower end of the cervical enlargement to the sacral segments has the appearance of having been wound carelessly but tightly with fine thread showing every where little irregular ridges and bulges, evidently the swollen cord structure bulging through the strands of the pial tissue. There was some slight cloudiness of the pia-arachnoid over the posterior surface. On section, the edges evert to a marked degree, and the anterior horn region looks softened, swollen, and almost diffluent; that is, in the lumbar, dorsal, and to a less degree in the lower cervical region.

Second Sacral Segment: Microscopically, there is infiltration of the meninges with round cells equally well marked all round the cord. This infiltration does not effect the nerve roots. The superficial vessels are congested and surrounded by lymphocytic exudation; those of the cord substance are similarly congested and show the same surrounding round-celled exudation. The infiltration of the gray matter is also present, but not to such a marked extent as in the previous case. Many of the nerve cells have disappeared, but a few still remain and retain their normal appearance. The congestion and the surrounding exudation is quite general affecting these vessels coming in from the periphery of the cord as well as the branches of the anterior spinal artery.

Fourth Lumbar Segment: The same picture here, slight meningitis, marked congestion of the vessels of the substance of the cord with an occasional small rupture and hemorrhagic extravasation. The same perivascular exudation of lymphocytes and round-celled infiltration of the gray matter. The ganglion cells have entirely disappeared.

Ninth Dorsal Segment: An identical appearance to those already described. Only a few nerve cells in Clark's column on the left side remain.

Eighth Cervical Segment: The infiltration of the membranes is less marked than in previous sections. It is present to the greatest extent in the anterior fissures and follows the course of the vessel into the left anterior horn; the vessel is congested but shows no evidence of thrombosis. The congestion of the vessels in the substance of the cord is general, but the perivascular round-celled infiltration is by no means so marked as in the previous case, nor is the infiltration of the gray matter nearly so extreme. None of the ganglion cells are recognizable.

Fifth Cervical Segment: Present an almost identical picture to that just described, save that there are one or two ganglion cells still recognizable in either horn.

Second Cervical Segment: Presents a similar appearance, save that the round-celled infiltration is again more marked, especially around the vessels, but also in the gray matter.

Lower Medulla: The meningeal infiltration is here present; and there is marked generalized perivascular lymphocytic exudation. The nerve cells, however, appear quite normal.

Right Post-Central Convolution: Shows marked congestion of the vessels of the meninges with surrounding exudation of the lymphocytes; the meninges show a slight degree of infiltration; the cortex appears quite normal.

Right Olfactory Lobe: Shows nothing abnormal, although the vessels of the meninges are congested and show the usual lymphocytic exudation. The posterior ganglia were, unfortunately, not examined in either case.

The pathological picture in the two cases was then very similar, the second showing simply a more advanced stage of what was seen in the first. There is the same evidence of inflammation affecting both the cerebral and spinal leptomeninges, the same congestion of the vessels both on the surface and in the substance of the brain and cord, especially marked in the latter. There is the same lymphocytic infiltration of the gray substance both of the anterior and the posterior horns of the cord, but this is more marked in the first case where the surrounding white substance of the cord is also affected. In the first case, also, plasma cells are more numerous in the infiltrated parts, and the clumps of leucocytes surrounding the remains of ganglion cells can still be seen, notably in the sacral region, evidently acting as phagocytes demolishing the destroyed cells. The second case shows the process in a slightly later stage, the phagocytic work has been accomplished; the inflammation is beginning to subside again. In both cases the inflammation and edema of the cord substance is perhaps most marked in the dorsal region; but the cervical and lumbar enlargements are about equally severely affected.

The medulla and pons show the same evidences of meningitis, generalized congestion and round-celled infiltration, especially in the formatio reticularis. In neither case could I find organisms in the tissues. The micro-organisms found in the first case correspond very closely with those described by Gierswold in the Scandinavian epidemic, and since described as present in many cases in almost every epidemic reported. In no case could that be satisfactorily cultivated.

The disease, then, appears to be a general vascular infection, but regarding the etiology of the disease and the mode in which the infecting agent makes its entry into the body, we still remain in doubt. However, a great advance has been made in the last few months. First, Landsteiner and Popper,[13] and later, Flexner and Lewis,[14] have been able to inoculate monkeys with the disease. The latter workers in a most brilliant series of experiments have succeeded in transmitting the disease through a series of monkeys from one to the other. Their work is already too well known to require more than a reference to it. However, they have shown that the etiological factor is not a soluble toxine, and are of the opinion that it must be some minute organism too small to be seen by the microscope, similar in many respects to the unknown organism of rabies.

They have been able to cultivate this organism, and have caused the disease in monkeys by inoculating this culture. They have shown that the virus will penetrate a Berkefeld filter. They have demonstrated that it retains its virulence after having been frozen for a very considerable time. In view of this last point, it is difficult to understand why the disease should be stamped out in the winter months; unless, perhaps, the carrier of the disease germ is not operative. In any case, continued work should soon show us how to fight this dread disease, in the prevention of which, at present we are absolutely powerless.

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ACUTE POLIOMYELITIS, NATURE OF THE VIRUS AND POSSIBLE PATHS OF INFECTION

BY

J. S. FOWLER, M. D., F. R. C. P.
Physician, Royal Hospital for Sick Children, Edinburgh.

Acute Anterior Poliomylitis at the present time occupies much the same position in current medical literature as cerebrospinal meningitis did two or three years ago. In both cases the occurrence of epidemics has afforded opportunities for the study of the disease by modern methods, and, in addition to a fuller knowledge of the clinical features and varieties of anterior poliomyelitis, sufficient has been discovered concerning its nature to justify the belief that in future text-books of medicine it will find a definite place among the infectious diseases, as well as to lead to the hope that a specific curative or preventive treatment may one day become available

The epidemiology and clinical features of anterior poliomyelitis were summarized in *Edinburgh Medical Journal* a year ago (May 1909), and to the description there given there is little to add. Epidemics have also been reported from Pomerania by Peiper—57 cases, with a mortality of 11.7 per cent.—and in Upminster by Treves. The general characteristics of the epidemic disease resemble those of epidemic meningitis, children are affected to a larger extent than adults; direct contagion can seldom, if ever, be proved; single cases, sometimes groups of two or three, occur in a home; the mode of spread is suggestive of the existence of healthy infection carriers; abortive and aberrant types are common. The chief difference is the seasonal one, meningitis being a disease of cold weather, poliomyelitis a disease of summer. In addition to these points of similarity to meningitis, anterior poliomyelitis, looked at from the pathological point of view, bears some resemblances to the disease hydrophobia.

Transmission of the Disease to Animals.—The experimental infection of lower animals has engaged the study of a number of workers, most prominent among whom are Flexner and Lewis, Levaditi and Landsteiner, Romer, Krause and Meinicke, and Popper.

Nature of the Virus.—The infective agent used is an emulsion made from the spinal cord of an acute case of poliomyelitis, and the animal which is by far the most susceptible is the ape. Flexner failed to infect rabbits, guinea-pigs, horses, calves, goats, pigs, sheep, rats, mice, dogs, or cats, and although Krause and Meinicke appear to have carried on a successful series of subinoculations in rabbits, most workers have used only monkeys in their experiments. Krause and Meinicke, also, have obtained results with virus from a number of different tissues—spleen, liver, blood, and lumbar puncture fluid, and in this respect seem to have been more fortunate than most other observers. In his earlier papers Flexner deals with the serial infection of apes. Using an emulsion of spinal cord, and injecting it into the subdural space, he easily transmitted the disease from monkey to monkey. He also succeeded in carrying out successful subinoculations into the sciatic nerve of a series of monkeys. A point of some interest in connection with the mode of infection is that the paralytic symptoms depend to a certain extent on the site of inoculation. Animals inoculated in the sciatic nerve become paralyzed in the hind legs. Intra-cerebral inoculation tends to cause paralysis of the anterior part of the body. In this respect the virus behaves like the poison of tetanus. Paralysis occurs in four or five days, or after a somewhat longer period up to seventeen, twenty, or even forty-six days after inoculation. The disease is fatal in about 40 per cent. of the animals; some recover with typical residual paralysis. It is agreed on all hands that the pathological changes are identical with those of human anterior poliomyelitis. One of the most important facts about the virus is that it passes through a Berkfeld filter, and is not, therefore, one of the ordinary micro-organisms. It resists glycerination, as does the virus of rabies, and retains its virulence unimpaired on being kept frozen at—4° C. for four days, or at 4° C. for fifty days. A spinal cord which was kept dry over caustic potash for a week also remained virulent. The possibility of a filtrate through a Berkfeld filter being virulent on account of its containing soluble toxins rather than a living organism has been excluded by the transmission of the disease by the spinal cords of apes which had succumbed to inoculation with a filtrate. Flexner has made some experiments suggesting the possibility of cultivating the virus outside the body. He found that on inoculating bouillon containing rabbit serum or human ascitic fluid with portions of bacteria-free filtrate, turbidity developed. A monkey inoculated with the turbid fluid developed paralysis on the thirteenth day. None of the turbid fluids contained bacteria which could be detected by the microscope, or under the dark field microscope. The distribution of the virus in the body of patients dying of acute poliomyelitis is not known. It is not certain whether it is present in the blood in acute cases. The disease has been transmitted by using an emulsion of lymphatic glands from animals, and from a human case. The cerebro-spinal fluid of an acute case does not appear to contain the virus in an active state. (Cf. Meinicke's results, *supra.*)

While intra-cerebral and intra-neural injections are the most certain methods of inoculation, infection has been produced by various other channels—injection into veins, into the anterior chamber of the eye, into the peritoneum, and into the pleura. Subcutaneous injection appears to succeed comparatively seldom.

Possible Paths of Infection.—The nasopharynx being probably the site of entry and escape of the diplococcus intracellularis, Flexner experimented on inoculation at this site. He found that an emulsion of spinal cord from a recently paralyzed monkey brought in contact with the scarified nasal mucous membrane of another monkey produced the disease. He also found that the mucous membrane of recently paralyzed monkeys, infected through other channels, contains the virus. It would, therefore, seem that the infective agent of anterior poliomyelitis may be eliminated by, and possibly enter through, the nasal mucous membrane. Leiner and Wiesner have succeeded in transmitting the disease by feeding, and through the respiratory organs—by inhalation, by inunction of the nasal mucous membrane, and by intra-tracheal inoculation. Their results are in so far an advance on Flexner's that they were at pains not to abrade the mucous membrane of the parts inoculated. They noted a relation between the site of inoculation and paralysis. The paralysis appears near the site chosen, whence it would appear that the virus reaches the cord by the shortest route, perhaps along the nerves. In cases of intra-cerebral inoculations the paralysis often develops on the opposite side of the body.

Immunity.—In the human subject anterior poliomyelitis confers immunity. Wickmann, in his enormous experience of the disease in Sweden, never saw a second attack in the same person. In the same way, apes which have been inoculated and survive, exhibit in many cases immunity to reinoculation. Leiner and Wiesner noted this acquirement of active immunity as early as the second day after the onset of the paralysis. Flexner obtained it on the seventeenth day, and Levaditi from the twelfth to the twenty-fifth day. Romer and Joseph, however, think that a somewhat longer time is required for its development. Up to the seventeenth day they found evidence of hyper-susceptibility, and only procured immunity after the twenty-fourth to the thirty-third day.

Analogies to Rabbies.—1. The cord lesion recalls the perivascular infiltration which is characteristic of rabies. 2. The filterability of the virus. 3. The greater certainty of intra-cerebral and intra-venous as compared with other methods of inoculation. 4. The course of the paralysis, suggesting a propagation of the virus in the nervous system. 5. Bonhoff regards as characteristic of anterior poliomyelitis small inclusions in the nuclei of the glial cells. These are surrounded by a clear zone, stain only by means of Mann's stain or Lentz's modification, and resemble the negri bodies of rabies. Important differences between the two infections exist:—(1) Poliomyelitis is only transmissible to apes, rabies to all mammals. (2) Poliomyelitis virus can be cultivated *in vitro* (Flexner).

Changes in Cerebro-Spinal Fluid.—In the study of inoculation into the brain, Flexner investigated the changes which occur in the cerebro-spinal fluid during the incubation period. When a considerable dose of filtrate is injected the cerebro-spinal fluid withdrawn at the end of twenty-four hours is normal in amount, but contains many small cells with polyform nuclei. In seventy-two hours mononuclear cells preponderate, and the fluid is opalescent. On the day of the paralysis the fluid is only slightly cloudy, and contains a mixture of large and small lymphoid cells, and a few cells with polyform nuclei. These findings show that cellular changes begin in the meninges immediately after injection of a filtrate, and these persist for several days before the onset of the paralysis. If these results were confirmed in human cases we would have at our disposal a valuable means of diagnosing abortive and aberrant types of poliomyelitis. An abrupt change in the nature of the cerebro-spinal fluid, from being opalescent, rich in cells, and spontaneously coagulable just before, or at the time of the paralysis, to a more limpid fluid, poorer in cells, often occurs.

Attempts at Protective Immunisation.—Several workers have published accounts of attempts to produce immunity otherwise than by subjecting animals to an attack of the disease. Levaditi failed with cords heated to 56° C. and has employed dried cords, on the analogy of the Pasteur treatment of rabies, inoculating successively with tissue dried for 9, 6, 5, 4, and 3 days. Flexner's observation that virus resists drying for a week would seem to cast doubt on the feasibility of this method. Romer produced immunity by subcutaneous injection of virus, but the method is not free from danger, as it seems that in some cases, though rarely, the disease has been transmitted to apes by this channel.

Romer and Joseph have failed to detect antibodies in the blood-serum or cerebro-spinal fluid of infected animals by the complement fixation method. They state, however, that the serum of immune apes neutralizes virus *in vitro*. Analogy with rabies, however, forbids our hoping much from this observation, for a serum which will neutralize rabies virus *in vitro* is useless curatively. Flexner found that the simultaneous subcutaneous inoculation of heated cord did not affect the course of events after an intra-cerebral inoculation of virus. Krause states that he has produced immunity by subcutaneous inoculations of virus containing 5 per cent. of carbolic acid.

In connection with the epidemicity of the disease the question has arisen whether any similar disease affects domestic animals. Epidemics of paralysis among fowls have been reported by Starr and Wickmann in districts where anterior poliomyelitis was prevalent. The nature of this paralysis, however, is not known.

—1910 *Edinburgh Medical Journal.*

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A PLEA FOR THE ABOLITION OF "INFANTILE PARALYSIS" AS A SYNONYM FOR "POLIOMYELITIS"

BY

GEORGE P. SHIDLER, A. B., M. D.
York, Nebraska

The recent epidemic of poliomyelitis in Nebraska demonstrated beyond the peradventure of a doubt that in the epidemic variety of the disease very many cases exhibited merely a temporary inco-ordination of muscle groups, others absolutely no indications of motor involvements. The last statement opens the question of correct diagnosis, but I refer to undoubted cases in the same families where there were the same symptoms in other children with paralysis of varying intensities.

It will be of great service in future epidemics to have this idea clear in our minds that there need not necessarily be a paralysis, in fact in a very great number of cases there is no paralysis and yet the case will be poliomyelitis. To the board of health representative who hunts out these cases to quarantine, it will be of inestimable value not to have the attending physician able to say "Infantile Paralysis--why, there must be paralysis. The very name shows there must be paralysis," or "This is an adult, therefore even with paralysis, this cannot be Infantile Paralysis." These seen strange reasons but I have encountered these statements many times myself.

In the January 29th, *Journal A. M. A.* I reviewed at some length a group of sixty cases of the Nebraska epidemic 1909. In the study of these there appears a very clear subdivision of cases of the same disease varying at times so greatly as to make a clinical diagnosis outside of an epidemic almost an imposibility.

There are in general mild and severe types. The mild often suggest merely a cold or slight gastro-enteritis or constipation and in the absence of paralysis or the presence of other cases would pass often without medical attention or even with medical assistance to no further diagnosis.

Of the severer forms we find the meningeal, the cerebral, the bulbar, the neuritic and the typhoid types. These may dove-tail one or the other, slightly overshadowing another in a given case or there may be present clear cut types of the above mentioned classification. In the later event there arises a very great confusion among neighboring medical men during an epidemic, for each one is convinced that he is right regarding his case. Such confusion arose with us last summer.

The meningeal type presents symptoms of meningitis or cerebral-spinal meningitis. The first severe cases last summer presented this phase of the disease and the State Board of Health made a temporary diagnosis of cerebro-spinal meningitis until laboratory findings could be determined on sufficient cases. The quarantine was made under the name of "Cerebro-spinal Meningitis." One case I saw with Dr. Hallett of McCool Junction gave as pretty a picture of meningitis as can be imagined. The child was unconcious, back bowed, buttocks and head sustaining weight of child if placed on back, spinal column as stiff as board, spastic paralysis of arms and legs, rotation of eye-balls, mumbling and groaning, arms crossed rigidly over chest, legs flexed and stiff from contraction of ham string muscles. Temperature 104.2°, pulse 140, respiration very fast and labored. Such a case required close work to differentiate. A lumbar puncture gave a clear fluid which escaped under great tension at first. We centrifuged the specimen and stained with Wrights's stain. There were present only mononuclear lymphocytes. There were no intracellular organisms and no polymorphonuclear cells.

The bulbar type presents as a rule a patient with great prostration. This may come on within twenty-four hours or may follow a more general paralysis of arms or legs or other segments. These cases present the fatality of the epidemic as the involvement of the pneumogastric usually foretells death. The patients lie quite and peaceful. Temperature is high as a rule although one fatal bulbar case did not have a registered temperature of higher than 101° at any time. Respirations are shallow and abdominal. The thorax is barely seen to move. Death is caused by asphyxiation.

The neuritic cases have especial symptoms of a peripheral neuritis in the intractable pain along the nerve trunks and into the posterior root ganglia. There is excrutiating pain on movement of the limb, extreme tenderness on pressure. Ordinary analgesics avail little; opium affords the only relief obtainable. Lumbar punctures in two cases gave relief when large doses of opiates failed.

The typhoid types run a temperature for ten days to two weeks after the paralysis has ensued. The temperature is high and remittent descending by lysis, The tongue becomes dry and coated. There is headache and prostration. There were only two such cases, neither of which had diarrhea, enlarged spleen, rose spots nor bronchitis.

The old descriptions classified poliomyelitis as a childhood disease with a constant paralysis and a very low mortality. In the Nebraska epidemic we saw the beginning among infants but the ending among children, youths and adults with a very respectable mortality.

The last nineteen cases of the epidemic seen by Drs. G. W. Shidler, O. M. Moore and myself in our private practice show facts very clearly. These were not included in the original report of sixty cases previously mentioned.

In the first series (Jan. *A. M. A. Journal*) seventy-five per cent. of all cases were under ten years of age. The last nineteen showed that only forty-eight per cent. occurred in children under ten years of age. Two of these cases died with bulbar paralysis, both girls aged seventeen and ten respectively.

Time of Year,

Last two weeks in September.

Number of cases in family.

Single cases in family of one child or youth........	4
Single cases in family of more than one child or youth..................................	6
Two cases in family of two......................	2
Two cases in family of more than two...........	4
Three cases in family of three.....................	3

Thirty-one per cent. occurred as a single case where there were more than one child or youth approaching adolescence in the family; twenty-one per cent. of single cases in family of one infant, child youth or adult; forty-six per cent. where two or more in the family had the disease; forty-seven per cent. of cases, all susceptible, had the disease.

In the original series thirty-one per cent. of cases occurred as single cases in families having more than one child; forty-four per cent. in families in which there were two or more children, all of whom acquired the disease; four per cent. occurred in families where there was a single child; sixty-four per cent. of the cases in families where there was more than a single child affected in the same family.

The infection was traced in nine and probably the tenth case of this series.

SYMPTOMOLOGY.

Onset. In twelve cases the onset was sudden with the patient apparently in perfect health the day previously.

Temperature was high in six cases, moderate in eight, the remaining being from 99 to 101°.

Stiffness of neck was marked in all but two cases.

General tenderness was present in all but one case.

Vomiting—only five out of the nineteen showed vomiting as an attractive symptom.

Basilar headache constant. Patient invariably complained of severe, basilar headache.

Constipation the rule. Occasionally a patient would have diarrhea but so rare as to attract attention.

Fever, duration—

1 day	2 days	3 days	4 days	5 days	6 days	7 days	longer.
2	3	5	5	3	1	1	0

For the most part the rule in these cases was a descent to normal by crisis.

Paralysis. Supervened usually with the fall in temperature; various intensities; any groups of muscles might be involved. Both legs paralysis seemed to be of must common occurrence; one leg next. In the former series both arms and legs was most frequent with both legs next.

Duration of Paralysis. About eighty-five per cent. of cases have fully recovered, some quickly, some gradually; about ten per cent. have made partial recoveries; about five per cent. have made no perceptible improvement. The percentage of recovery in children, youths and adults is about the same. There seems to be no sure way aside from electrical reactions of pronosticating which cases will recover speedily and which will drag along. In general, fatal cases are more fulminating, there being greater prostration, more general paralysis ending in bulbar involvement and death

In view of these facts, namely that so many cases occur at least in the epidemic variety of the disease among children, youths and adults and secondly that so many cases did not result in paralysis at all, I believe that the term "Infantile Paralysis" should be relegated merely to the symptom column and not be used as a synonym for poliomyelitis.

REPORT OF AN EPIDEMIC OF TWO HUNDRED AND SEVENTY-NINE CASES OF ACUTE POLIOMYELITIS.*

BY

C. A. ANDERSON, M. D.
Stromsburg, Nebraska.
Health Officer, Polk County, Nebraska.

The first case that is now suspected of having had infectious poliomyelitis in Polk County, occurred about the middle of May, 1909, in a child of six years which came from some distant part of the state, just after recovering from the acute stage of poliomyelitis. Those who saw the child wheeled about the city say that he moved and behaved as many disabled children now seen in the community, weakened from the recent epidemic of infectious poliomyelitis. The first case that I saw occurred eleven miles northwest of Stromsburg on May the 30th, having been ill for one week, and had during that time been under the care of a doctor from the nearest town, who had made a diagnosis of Lagrippe. A history of fever during the first few days, followed by fretfulness, and weakness was elicited. The next time I saw this case was in Stromsburg four weeks later at the Fourth of July celebration, where a number of other recently ill children were mingling with the masses of people. The partial paralysis of one arm now enabled me to discover the nature of the case. I was told that the child's muscular movement had been very much limited during the first three weeks after the illness began and that the other children in the family had ailed in a like manner, but less severely, and had rapidly recovered. Ten days after seeing my first case I saw two more cases on the second day of their illness in a family living five miles northwest. My diagnosis was the nervous form of Lagrippe, as in the previous case. Five weeks later I saw these two children in a neighbor's family, which, without doubt had been infected by the former, and was surprised to notice a marked lameness, and on examination found that it was a case of the infectious spinal trouble observed in this series of cases.

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*Read before the Nebraska State Medical Association.

During the illness of the first family, eleven miles northwest, two related families visited in the home and a fifteen-months-old child sickened on about June the sixth, a week after said visit. This case was not seen by a doctor during the illness but was diagnosed from the resulting lameness.

A few days later, on June the fourteenth, I saw a six-year old boy of the other related family,—nearest neighbor to the first family. This boy had been sick a week, becoming ill on the ninth day after the visit in the first family. A history of fever and pain was elicited and he was thought to be suffering from rheumatism. His legs were so painful to manipulation that the paralysis present was not discovered until later, but the lack of movement was ascribed to tenderness and pain. An infant brother sickened soon after, ailing mildly for a few days, and then it was noticed that the child was unnaturally limp when carried about. This lasted about a week when recovery took place. In close succession after these cases eleven children in the six neighboring families became ill, and some of them are now seriously paralyzed. These cases were not seen by me, but by other physicians from three different towns, with exception of one family, which had no doctor. As far as I know these cases were not diagnosed until I looked them up as health officer on the first of August, and found that the modified Kernig sign and paralysis were yet plain.

About the same time a number of cases of peculiar paratyphoid were reported from the new town of Polk, twelve miles southwest of Stromsburg, and later developments proved them also to be poliomyelitis.

A few days later, I saw the first three cases in which I discovered paralysis, and upon inquiry found that other physicians also, had paralyzed cases. I at once telephoned the State Health Inspector, Dr. Wilson, asking him to come without delay, which he did, and after seeing nine cases that were more or less paralyzed, it was evident to us all that the trouble was cerebrospinal, though the spinal symptoms predominated, and that it was infectious. We at first had difficulty in agreeing to an undoubted diagnosis, because of the misleading descriptions of this disease in our text books, also because of the misleading reports by the laboratory men who examined the cerebrospinal fluid for us. To this may be added our inexperience with the disease. We were informed that no legal provision had been made for quarantining such cases and isolation was recommended, but of course could not be enforced, nor could the impending Fourth of July celebration be abandoned. This celebration was well attended and shortly after cases were reported from communities, previously free from the disease and having had representatives present at the celebration. From May the thirtieth to July fourth, we had in the Stromsburg territory thirty cases, while from July fourth to August third, just thirty days, we had one hundred and fifteen cases. It should be remembered that on July twenty-first the State Board of Health, having met in extra session, for the purpose, authorized quarantine of all the affected families for three weeks, to be followed by fumigation. Owing to the number of cases concerned, we did not reach all for several days, and the quarantine was begun on July the twenty-second, being the same as that recommended for diphtheria, the bread-winners being permitted to pursue their business after taking certain precautions. And in twelve days, or on about August third, the epidemic was practically at an end in the Stromsburg territory, as after August third we had only fifteen cases, and the same prompt results were acquired in the west end of the county. The epidemic did not reach Osceola, our neighboring town on the east, until August, when some nine cases occurred, and having profited by our experience in Stromsburg, they immediately placed the affected families in absolute quarantine, which promptly stamped out the disease in that city. The fact that the people in general were thoroughly aroused by the ravages of the disease contributed much to the effectiveness of the quarantine in Polk County. When a house was placarded, it was widely known, and few would knowingly expose themselves to infection, their statements to the contrary notwithstanding. The schools were closed, all public gatherings were proscribed, and parents were requested to keep their children on their own premises.

Mode of Infection.

I believe that the majority acquired the disease directly from another ill or recently ill person, but a number of cases occurred that strongly indicated that the infection can be carried by a third person. Two families, A and B, living thirteen and fourteen miles northwest of Stromsburg had had no visitors nor had been away from home for some time except the sixteen-year-old daughter from family B, who visited at a family C, two miles away, where a child was ill of poliomyelitis at the time. When this girl came home, the children from family A were visiting there. Five days later, a seven-year-old sister of this sixteen-year-old girl, who had not been away, became ill of poliomyelitis. A few days later a six-year-old daughter in family A became ill, paralysis setting in on the second day, gradually involving all the extremities and trunk, causing death from bulbar paralysis on the fourth day. On the following day, or five days after the fatal case became ill, another sister and brother became suddenly and violently ill, the latter also dying on the fourth day of bulbar paralysis. At intervals of a few days, three other children in family B became ill, but all recovered completely in a few days, except two who had a protracted recovery. In at least one case, the infection was certainly carried by a thresher who had the sickness at his home, unbeknown to the neighbors, and a fourteen-year-old girl sickened about a week after the threshing. Extraordinary precautions had been taken against infection in this family for weeks previous to this indiscretion.

In two families a peddler is suspected of having carried the infection. Hard work in the hot sun during the premonitory stage seemed to aggravate the symptoms considerally. As already stated this epidemic occurred during the hot months of the year, but equally hot weather persisted for weeks after the epidemic was well under control.

Previous Conditions.

Nearly all of those effected were in fine health previously, having been invigorated by the healthful country environment, and the strongest child in the family was often affected the most severely. In my list of eighty-six cases that have come under my observation, forty-eight were males and thirty-eight females and the ages ranged from six months to thirty-six years, the oldest case dying of bulbar paralysis on about the fourth day.

The ages ranged as follows:

Age less than one	5	Age from 10–11	1
" from one to two	7	" " 11–12	1
" " 2–3	7	" " 13–14	2
" " 3–4	9	" " 14–15	3
" " 4–5	9	" " 15–16	1
" " 5–6	9	" " 17–18	1
" " 6–7	12	" " 18–19	0
" " 7–8	9	" " 19–20	2
" " 8–9	4	" " 20–21	1
" " 9–10	2	" " 21–22	1
		Age 36	1

Of the 86 cases 84 per cent. were less than 10 years old.

Number of cases ill in a family:

Single case in family of one child	1
Single case in family of two children	2
Single case in family of three children	7
Single case in family of four children	3
Single case in family of seven children	1
Two cases in family of two children	7

Two cases in family of three children	5
Two cases in family of four children	1
Two cases in family of five children	2
Two cases in family of six children	1
Two cases in family of eight children	1
Three cases in family of three children	1
Three cases in family of four children	2
Three cases in family of five children	2
Three cases in family of six children	1
Three cases in family of seven children	1
Four cases in family of four children	1
Five in family of six children	1
Six cases in family of ten children	1

In forty-one families of 150 children, 86 or 57 per cent. contracted the infection. Isolation of the sick was carried out as far as possible and where many were sick in one family infection had usually occurred before medical aid was called.

Paralysis.

It is difficult to imagine a very great disturbance in the ganglion cells of the anterior cornua of the cord, such as occurs in poliomyelitis, without some destruction of cells, thus rendering useless some of the nerves that supply muscular tissue; and if this destruction is sufficiently extensive, it will be indicated by noticable paralysis, and it is this noticable paralysis that will be referred to. The function of some of the nerve tissues surrounding the foci of severest involvement is depressed by the attendant congestion and infiltration, causing some paralysis that will later disappear, and this accounts for the improvement that takes place after the acute symptoms have subsided. I have classified the cases as follows, according to the duration of the acute symptoms, which compel the patient to remain in bed, or at least cause disability sufficiently severe to prevent walking unassisted. This is done to show any probable relation between the duration of the acute symptoms and the prognosis as to the seriousness of the resulting paralysis. The number of cases that recovered from the acute symptoms as just defined, in less than a week, was thirty-two. Thirty of them showed no marked paralysis except that a leg might suddenly give away while walking along, thus causing the little patient to fall. The spine is more or less spastic, especially in the cervical region and the gait is commonly stiff and awkward. In some cases these symptoms would discontinue in from one to two days. The remaining two were paralyzed as follows:

Left leg and right arm, recovery almost complete in five months. Mental symptoms, recovered in nine months.

The number of cases that recover from the acute symptoms at the end of one week was seventeen, eight of which had no well defined paralysis, and the remaining nine were paralyzed. Six recovered from said paralysis as follows:

Left leg, recovered in two week.

Four were paralyzed in both legs, three recovering in three weeks and the other in eight months.

Intercostal muscles, recovered in one week.

The following three have not yet fully recovered from the paralysis.

Facial paralysis, one case.

One leg and back, one case.

Both legs, subsequent history unknown.

The number of cases that recovered from the acute symptoms at the end of two weeks was 7, one of which recovered without paralysis, and six were paralyzed. Two recovered from said paralysis as follows:

One was affected mentally and recovered in one week.

One eyelid paralyzed and recovered in two months.

Two were paralyzed in one arm and two in one leg and not completely recovered in eight months.

The number of cases that recovered from the acute symptoms at the end of three weeks was twelve, and all were paralyzed. Six recovered from said paralysis as follows:

One leg, recovered in seven months.

Right arm, recovered in six weeks.

Diffuse weakness, recovered in one week.

Both legs and back, recovered in two months.

Both legs, recovered in five months.

Both legs and trunk, recovered in five months.

The following six cases have not yet (eight months) fully recovered from their paralysis:

Right leg, two cases.

Left leg, one case.

Left leg and trunk, one case.

Both legs, one case.

One arm and one leg, one case.

The number of cases that recovered from the acute symptom at the end of four weeks was seven. All of which were paralyzed and three recovered of said paralysis in three months as follows:

Both legs, two cases.

One leg, one case.

The following four have not yet (eight months) recovered from the paralysis:

Right leg, one case.

Both arms, one case.

Both legs and trunk, two cases.

Three cases were unable to walk for five weeks, and after eight months two of them are paralyzed in the left leg, and have not fully recovered, while the third, suffering from paralysis of the spine, has functionally recovered.

The following two cases were unable to walk for six weeks, and are yet paralyzed as follows:

The one, both legs and trunk.

The other, the right leg.

One was unable to walk for three months and is still partially paralyzed in both legs and in the left arm.

At the end of eight months, one paralyzed in both legs and trunk cannot walk unassisted, while two paralyzed in both legs can now walk a few steps without holding on to things. These three are the most seriously paralyzed of all the surviving cases.

Of the 82 surviving cases 48, or sixty per cent., were at first markedly paralyzed, and, of these, 26 have since functionally recovered, while 21 are yet more or less paralyzed, many of which will need some orthopedic treatment to prevent deformity, and to aid nature in the improvement which is yet progressive in many of these cases.

The present residual paralysis in these 21 cases can be summed up as follows:

One arm, three cases.
One leg, five cases.
Both legs, four cases.
Face, one case.
One leg and intercostal muscles, one case;
Both legs and back, four cases.
Both legs and one arm, three cases.

The distribution of the paralysis of muscles usually follows their segmental relation in the cord, and as is already indicated by the frequent involvement of the arms and legs, the cervical and lumbar enlargements are most often affected to a disabling degree. The anterior leg and thigh muscles were often paralyzed without any apparent involvement of the posterior muscles, while the reverse was not true in any of my cases.

As a rule more members are at first paralyzed and more extensively than will persist. One case had extensive paralysis of both legs and arms; the legs recovered and the arms remained paralyzed. Another seemed paralyzed from the feet to the neck, excepting one arm and the respiratory muscles, and now no marked paralysis remains excepting in the lower extremities and pelvic region, and this is the most seriously paralyzed of all the surviving cases. The members having the least involvement and I believe those last involved will recover first.

The atrophy is largely in proportion to the degree of paralysis, mild in some cases and marked in others. It begins early, being marked in three weeks, and decreases as the muscles regain their innervation.

Four cases of this series died, all of bulbar paralysis. One was my own case, while the other three were cases attended jointly by myself and some other doctor.

According to Dr. H. Winnett Orr's diligent research into the epidemic, 279 cases occurred in Polk County with ten deaths.

In many cases the incubation period was difficult to establish, owing to the abundant opportunity for infection before the quarantine was authorized, but five to ten days was certainly common.

Symptoms and Diagnosis.

The following observations are the result of a somewhat careful study of the previously reported eighty-six cases that have come under my observation and a number of others that I have seen as health officer. The disease may be divided into two main classes, those with prominent cerebral symptoms, and those with spinal symptoms most prominent. Those having marked cerebral symptoms were in the minority, numbering about eleven in my series and perhaps that many more were less marked. Only one of the four fatal cases had any marked cerebral symptoms, while the other three were perfectly conscious during almost the entire course of the disease. Two of the cerebral cases had some paralysis of the face, which has recovered. They mostly had a sudden onset and run a stormy course, being marked by delirium, convulsions, and sometimes drowsiness. The convulsions may be local or general. Six of my series had bulbar symptoms and, as stated, four of them died. Twenty-two had especially severe neuritic symptoms as indicated by marked hyperasthesia and severe pain in the extremities and sometimes in the chest and abdomen.

The first premonitory symptoms of poliomyelitis are probably the result of meningeal irritation, and were observed in a considerable number of cases in from one to three days, and in one case a week, before the acute symptoms began. These consisted in a slight abnormal muscular rigidity about the spine and a modified Kernig sign, i. e., usually more marked in one leg than in the other. The spinal rigidity can best be demonstrated if the patient sits in bed with legs extended, and, after being asked to stoop forward, the head is gently pushed forward a little more. This causes some pain and the child will cry unless gentleness is used. These two symptoms are often accompanied with a slight rise of temperature, which is prone to fall to normal in a few hours, especially if a laxative is given, as constipation is often an early symptom. The knee reflexes will usually be found exaggerated and unequal in the two legs, as the two sides of the cord are rarely affected in the same degree. When paralysis is imminent the reflex is decreased.

During this premonitory stage, other but less frequent symptoms occur that seem to indicate an early involvement of the cord, and consist in weakness of some member, most often the leg. This is usually a later symptom, however, and when found is of valuable diagnostic importance. One strong, well developed six-year-old girl in climbing a fence suddenly fell because one or both limbs gave way. She rose and continued to walk about, and some hours later in walking down the stairs fell and rolled several steps without injuring herself. The following day she developed the acute symptoms and became seriously paralyzed. Numerous other such cases could be cited.

The acute symptoms usually begin with a slight rise of temperature, 99 to 101°, (rarely a chill) increased modified Kernig sign and a somewhat more easily marked spastic condition of the spine, especially in the cervical region. Headache and pain along the spine is now almost universal, but not much pain elsewhere except in severe cases, and if the patient is disturbed. Examination for the Kernig sign is quite painful, except in very moderate cases.

Unless the case is very mild or abortive the temperature is nearly always highest on the second day, and ranges from 100 to 105, 101 to 102° being most common. The face is flushed sometimes intensely so and rarely has a somewhat mottled appearance. Semi circles under the eyes of a markedly deep hue are noted. When the Kernig sign is more marked, the spine more spastic, the head often retracted considerably, and stooping forward is so painful that the child will refuse to drink though thirsty, or a nursling to nurse, on account of the difficulty in getting the head forward. Marked opisthotones occurs in some cases. Some sensitiveness or even pain is complained of in the limbs that are destined to be paralyzed. The headache, and pain along the spine, however, constitutes the most suffering felt at this stage. The pulse is rapid, being 120 to 140 or faster in severe cases. The spastic condition is often general. Tremor and clonic movements may be general or local, and are common. Sleep is usually quite good as the patients are more or less drowsy. The appetite is fair during the fever stage and good afterwards if the bowels are kept open.

Vomiting was common, even obstinate in some cases, and not of gastro-intestinal origin. Constipation was present in every case seen during the fever stage. The atony of the intestines and bladder was in proportion to the severity of the other acute symptoms and improved as the latter subsided, and rarely caused much trouble after the fourth day. The child's bowels would hold an abnormal amount of soap suds before peristalsis would expel the contents, and three such injections were commonly required to clear the lower bowel, and but little fecal matter would pass before the third injection, when a free movement would occur. Daily doses of castor oil and injection of water and glycerine gave the most satisfactory results in overcoming the constipation.

The following facts seemed to be good evidence that the atony of the digestive tract is due to lack of innervation, rather than to local toxemia: (1) The bladder was affected much in the same degree as the bowels. In severe cases there was little or no desire to urinate during the acute symptoms. No albumin was ever found, though often looked for. (2) The bowel contents were not especially offensive, except as could be explained by the inertia and long retention, and when thoroughly moved daily were not offensive and the patients had good appetites, but the atonic condition remained the same and an equal difficulty to empty the bowels would be encountered the following day. Catheterization was not required in any of my cases, as it was found that the urine would be voided as the water was passed from the bowels after an enema, though I was several times told that no urine had passed for twenty-four hours.

On the third day of the fever in the severe cases the temperature was about the same as on the first, and in milder cases had reached normal. In other respects the symptoms were the same as on the previous day, though somwehat milder, except the modified Kernig sign, which remained the same or was even increased. The skin is moist and often sweating is profuse. On this day paralysis is usually evident, if it will occur, and if general paralysis of an organ occurs, it becomes limp, in sharp contrast to the other more tonic or even spastic members. Mild cases may be found out and playing on this day, and even on the first and second, but walking with their heads well back and a somewhat stiff or awkward gait. A leg may occasionally give way, causing the child to fall, especially if touching an obstacle. In all cases the temperature became normal on or before the fourth day, and at most was 99° during the first half of that day. The headache, and usually the backache, was now over, but severe, intermittent, sharp pains, generally in one or more members, now became severe in some cases, and twenty-two of my eighty-six cases were of this markedly neuritic type.

If more than one member was paralyzed, the severity of the pain was usually found to be in proportion to the severity of involvement. These pains, which may be due to infiltration of the cord, last from one-half minute to ten minutes, and if of short duration may recur every 15 minutes or not oftener than every few hours. The marked increase in frequency of occurrence at night may be due to unconscious attempts to move while asleep. The child awakes crying as though severely tortured, becomes flushed in the face and covered with perspiration. And during the intervals between the pains, if any attempt is made to move or disturb the patient, he will complain pitifully, but make little resistance in severe cases, as that increases the pain. The hyperesthesia, intermittant pain, and even the spastic condition, may last from a few days to four weeks, and compel the patient to remain in bed for that length of time. This pain is not in the joints, but more general and severest along the course of the great nerve trunks.

A few of the severest cases had markedly diminished sensibility in the hands and feet, and in two cases more extensively, the sphincters being involved. These two had incontinence of the bladder and bowels. A sensation of formication or tingling was present in a number of severe cases, and could be demonstrated in children sufficiently old to urge the nurse to stroke or gently rub the affected members.

The reflexes were often markedly increased during the premonitory stage, and later commonly abolished in one or both knees, and as the modified Kernig sign were unequal in two knees. Paralysis of the anterior thigh muscles would of course abolish the knee reflexes. Those recovering without paralysis would often have markedly exaggerated knee reflexes for several months.

The flushed and rarely mottled appearance of the face during the fever stage has already been referred to, and a general arethema occurring after the fever stage was often noticed especially in younger children.

The rash is usually coarser than that of scarlet fever and less spotted than measles. Marked rose-colored spots from a half inch to two inches in diameter were noticed in six or eight cases and probably occurred oftener, as all patients were not carefully examined over the entire body. They would remain a few days and then fade into brown and gradually disappear.

Sudamina was common after the fever stage in connection with the profuse sweating.

Mental irritability is common for weeks after recovery from the acute stage.

Differential Diagnosis.

Barring one case of measles, we were particularly fortunate in not having any other epidemic disease for some time before or during the epidemic of poliomyelitis, and usual, as it was during the hot season, we had scarcely any acute digestive trouble among the children. The latter could be accounted for by the unusual watchfulness parents exercised over their children at the time, in the hope that infection by the dreaded disease could be averted. When in doubt, the telephone was utilized to the fullest extent to confer with their doctor. The only other troubles for which the first few cases of poliomyelitis in Polk County were mistaken, as far as I know, was lagrippe, auto-intoxication, rheumatism, paratyphoid, measles, and meningitis.

During the first two days, some cases, especially in infants, may simulate lagrippe somewhat, but can ordinarily be differentiated by the presence of the modified Kernig sign and the more or less spastic spine. The nervous symptoms such as tremor and spasmodic movements are also more marked. The child will often be awakened from his sleep by sudden spasmodic movements that cause the arms, for example, to strike the sides of the bed, exaggerated or absent reflexes may exist and later paralysis may occur. There was also complete absence of any acute catarrhal trouble in the respiratory tract and eyes, and no coughs or appreciable sore throats, though somewhat reddened at times.

Auto-intoxication is often marked by atony of the bowels, but the bladder is not affected in a like degree with muscular inactivity and marked relief results from clearing and disinfecting the digestive tract; while in poliomyelitis the nervous symptoms persist.

In rheumatism there is usually some tenderness, swelling or redness about the joints, while in poliomyelitis, the pain is intermittent, and as well as the sensitiveness, corresponds with the distribution of certain nerves and is most marked after the fever stage.

The salicylates are also ineffective.

In typhoid or paratyphoid, there is a gradual onset, longer continued fever, positive Widal, poor appetite, and no Kernig sign, spastic spine or paralysis, while the reverse is true in poliomyelitis.

One ten-months-old child was reported to have come in contact with another child who was ailing mildly and said to have had a rash. In about ten days it became ill, had fever and cerebral symptoms, and when the fever subsided on the fourth day, a rash appeared that was mistaken for measles, but paralysis of an eyelid soon cleared up the diagnosis, and other children in both families developed poliomyelitis a few days later.

Cerebro-spinal meningitis and the cerebral type of poliomyelitis may, during the first few days, be very difficult to differentiate, both commonly having a violent onset and marked by headache, backache, spasticity, delirium, convulsion, opisthotones, projectile vomiting, and constipation. Spinal puncture should clear up the diagnosis. In meningitis, the Kernig sign is mostly equal in the two legs, while in poliomyelitis there is usually considerable difference, the one leg being much more spastic and painful than the other.

Fickleness in the temperature is the rule in the former, while in the latter the temperature is regular and the fever of short duration, lasting from one to four days at the most, gradually rising to a maximum, which is usually maintained from twelve to twenty-four hours, when a gradual fall to normal begins. And then the characteristic motor paralysis is evident, or the patient recovers at once with a more or less spastic spine or extremities, or both, which may subside in a day or two; or great sensitiveness to touch and motion and intermittant pains along certain nerves, accompanied with contractures at the knee in the sitting attitude, may continue and keep the patient in bed as long as five weeks, but during all this time having a normal temperature and a fair to good appetite, while the sensory tracts usually escape except in the severest cases and their involvement is then of secondary importance to that of the motor areas.

Treatment.

The treatment was eliminative and supportive with rest in bed in the lateral position. Cold was applied to the head and counter irritation used along the spine. Hot baths after the fever stage seemed to relieve the intensity of the neuritic pain somewhat. One case improved remarkably during the night following the fumigation, while inhaling the formaldehyde fumes yet remaining in the bed clothing. The previous day the pain and muscular contracture of the leg prevented extension of the knee to more than a right angle, while the following day it could be extended completely, permitting some walking. No especial importance is attached to this however, as improvements were frequently sudden. Urotopin was sometimes given and with uncertain results. It is to be hoped that a serum will soon put the treatment on a more effective basis.

Children are not insusceptible to the action of mercury, but are salivated with difficulty.

Irregular pulse is normal in old people, a cerebral symptom in children, and a cardiac symptom in adults.

THE SURGICAL TREATMENT OF INFANTILE PARALYSIS.*

BY

MAX HERZ, M. D. (Munich) Sidney, Australia.

Although the theme of my paper to-night is the treatment of infantile paralysis, I hope you will permit me to dwell for a moment on a significant discovery which has been made during the last few months in connection with this uncanny disease.

It has not escaped the notice of scientists and practitioners that infantile paralysis showed some similarity to rabies, as both diseases direct their main attacks against the spinal cord, the marrow being the battlefield where the gravest destructions are brought about. The recognition of this resemblance, superficial as it may seem to be, furnished the torch to light up things unknown; it led Prof. Romer, of Marburg University in Germany, to undertake vaccination experiments, *i. e.*, on lines which had been successfully followed up by the Pasteur School in the case of rabies. The last epidemic outbreak on the Rhine in the autumn of last year furnished the material. A small piece of brain and spinal marrow substance was taken from a child who had succumbed to an attack and mixed, to form an emulsion, with cerebro-spinal liquor. With this, mice, guinea-pigs, rabbits, and a monkey were vaccinated intracerebrally, into the brain. All remained sound and healthy—all but the monkey. On the sixth day after the operation the animal did not appear to be quite as merry and frolicsome as hitherto; on the seventh it was limp, sad and seedy. In the evening it showed a slight paresis of the right arm. In the morning of the next day it was found lying on the floor of its cage, all limbs paralyzed, the sensorium being free. It died in the same evening. Thus one had succeeded in transferring the virus of a deadly case of infantile paralysis by intracerebral vaccination to a monkey, which succumbed to the same disease. Following this up Prof. Romer used the marrow of this monkey, which had died from this experimental poliomyelitis, to vaccinate

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another monkey, with the result that this second monkey died also with all the signs of a typical attack of infantile paralysis, the section of the spinal cord showing like that of the first monkey, all the pathological characteristics of such a poliomyelitis. This second transmission proves that the cause of our disease is a living virus, not a toxin, not a poison. This momentous discovery was confirmed by similar experiments carried out in the United States by Flexner and Lewis, in France by Landsteiner and Levaditi. Prof. Romer now succeeded further in proving that a monkey which had battled through a more lenient attack of poliomyelitis was immune against an infection, which killed a sound control animal. He could, by injecting a small dose of virus containing emulsion, produce immunity in monkeys. Strange small oval corpuscles have been seen in the dark field of the ultra-microscope. Are these the long sought originators of this infantile plague? These are the discoveries of the last months. And they are momentous indeed. A wide perspective is opened up, a breach in the sombre wall which shrouded in darkness this disease so much dreaded. There seems to be no theoretical obstacle to prevent a vaccination method to be found to produce immunity. Will we be able to use the serum as anti-toxin? Will serum treatment, will vaccination, draw the sting out of this curse on our children? Will they be able to chase the malady out of the body and make good again all the evil done, repair the destruction, free the gray matter from the strangulating clutches? These are questions to the future. And if the times to come bring affirmative answers, my remarks on the treatment of infantile paralysis may be forgotten as not called for any more, and the acquaintance with the progress of surgical treatment of poliomyelitis will only be a passing one—an interesting one none the less I trust. But the road to that goal is yet long, and the thought that destroyed ganglia can be built up again by vaccination or serum treatment, seems to be condemned to remain a pious wish.

I limited myself to speak to-night of the *surgical* treatment of infantile paralysis. This is the treatment for the third period of poliomyelitis when the paralysis has become chronic. Roughly, we may discern three periods. Firstly, the acute attack, either preceded by pain, and disturbance in the digestive organs, or falling upon the child with dramatic suddenness over night. Very little we can do here at present besides ordering rest (Lorenz's plaster-bed procures the best means to that end) and fever diet. Secondly, we have the period of recovery. The microbes seem to inundate the spine, attack and defeat the gray matter in the anterior horns all along the marrow. But gradually the flood subsides, muscle after muscle becomes restored and takes up work again—not all, however, some are nearly always left dead and gone. Massage, baths, electricity will support this natural recovery, not to a very great extent perhaps, but they are useful. The work of the medical man, however, must begin here in earnest. The greatest attention ought and must be paid to prevent the deformities in the paralyzed limbs. Much more than hitherto must that be our care. When one sees these contractures in hips, knees, feet, these deformities, which make the very heart ache, and when one realizes that all these can be prevented, and prevented by early action, it is then that one conceives the thankful duty which awaits the general practitioner. He may apply splints of plaster of Paris, leather, iron, steel, poroplastic, wood—the material does not matter as long as he gives a splint at all and prevents the sound muscles from pulling the limb their way, as long as he stops gravitation from drawing crippled parts earthwards. It must be realized that these deformities can be prevented—must be prevented.

When now, after six to eight to ten months the recovery has come to a stand-still, when there are muscles, atrophied and lifeless, which refuse to obey the will, when the disease is entering upon its third period—what ought to be done then? In former days splints were the only help. They were brought to perfection; elastic bands, spiral springs took the function of the paralyzed muscles. But on the very day almost these artificial supports had reached their highest excellence, the thought turned to the care how to become free of them again. Certainly they allowed cripples to walk who could not do so before. But they were heavy, doubly weighty on a thin, weak paralyzed limb; they called for repairs, for renewal when the patient grew; in short, such a patient became the slave of his apparatus.

It was Nicoladoni's genius who already had born the idea of entero-anastomosis, who discovered now the new land of transplantation. Unnoticed for some time, it was later fully explored by Drobnik. In the beginning was the transplantation of tendons; now we shift also the origin, the fleshy part of a muscle, the whole muscle bodily; we transplant nerves; we transfer bones; we implant whole joints. The path to the state we have reached today was often rough, often strewn with bitter disappointments, but it has led us to a height from whence we see into a land of blessing, into a realm of unlimited possibilities. Nicoladoni's name will go down the corridors of time as one who served humanity well.

In a disease like infantile paralysis where every case almost differs from the other, although brought about by the same cause, it is impossible to lay down hard and fast rules applying to one and all. The individual merits will determine the treatment. To generalize is impossible. The state of the paralysis, the number of the surviving muscles, the deformity, age, weight, the chances of growth, all have to be considered before a plan of operation can be sketched out. But it is an advantage here that such a plan of campaign, outlined after a careful examination, can be followed out exactly; the end, the definite results, can be given with almost mathematical precision. A multitude of methods have been devised. All have been weighed, but many were found wanting in the balance. I do not intend to take up your time in recounting all, but will only lay down the principles of this treatment, the great outlines, based on the experiences of my own practice and of my assistant-ship with Hoffa and Lorenz, and discuss the details afterwards when demonstrating the slides.

Above all, it is indispensable to remove any existing deformity before attempting a transplantation, and by means of wrenching, without cutting, we can almost every time achieve this end.

The judicious choice of the surviving muscles to be transplanted is the next claim. Which muscles may be spread without harming the function of a limb? Which ones will have to be replaced to institute the renewal of the use? The question is quickly answered when we have two, three, or more muscles exercising one and the same function. One of the peroneal, the long toe muscle, some of the knee flexors, may readily be shifted without impairing the normal use. But we meet more desperate cases, where less important muscles are alive, whilst the more valuable ones have stopped working. We find for instance all the flexors of an arm paralyzed and the triceps hale and hearty. We are justified in taking this triceps for bending purposes, as the straightening of the arm is mostly—as is the flexion of the knee—a matter of gravitation, the parts sinking and falling by their own weight. Muscles with less important functions have to take over the more important ones. The mover of the toes will work the foot, the flexor of the knee straighten that joint, the gluteus maximus will take the place of the gluteus medius and keep the pelvis in the balance.

How do we use and fix these muscles at our disposal? There is the method of grafting tendon into tendon, with its two divisions of active or descending and passive or ascending transferring. Or we choose new points of attachment and sew the tendon to the periosteum, or fix it into the bone direct. All methods have their proper places, and meet certain requirements. Often all three are applied in one and the same case and operation. We may further divide a tendon and graft the part split off somewhere else. But to secure a success I think it is essential to provide a like function for both parts. It seems to me *ultra vires* of a muscle to supply power for two different movements, to act as extensor and flexor. I know the literature mentions some cases as being successful, but my experience contradicts them.

It is well when the new tendon runs in as straight a line as possible, or, if a curve or bend cannot be avoided, this turning point should be a fixed one, guaranteeing a smooth working without loss of actual contracting power; towards that end it is important to prepare a proper sheath to avoid a connection of the tendon wounds with the skin.

The transplanted muscle should be fixed in a way procuring as near as possible its normal tonus. This applies, too, in cases where we leave the tendons attached to their normal insertions and shift the muscle origin.

The physiological side of the question is perhaps less perplexing than it seems to the first glance. Naturally it is astounding to see flexor muscles acting as extensors, antagonistic muscles working together—to watch muscles taking over foreign functions. But it is well to remember that we—that the gray matter in our brain, which houses the will, does not move one distinct muscle (if that were so, what finished anatomists we would be!) but simply perform a certain movement. We are conscious of straightening the knee, not the extensor cruris. We have learnt that to attain a certain position we must do certain things, which produce certain sensations through the contraction in the muscles, the use of the ligaments, the capsule, the touch of the bones. All this forms in our memory the picture of a straightened knee, and this we try to reproduce every time. The working of the transplanted knee is achieved in the same way. After a successful transplantation we coax the child into using the new muscles. The result is felt and seen and fixed with all the details in the memory as a picture of movement, which is reproduced every time when wanted. The muscle itself cares nothing how it moves a limb—it contracts, and there its work ends. The only difference from the normal state is that the working centers in the hemispheres are connected and regulated by different memory pictures.

The transplantation of nerves is a young shoot on the tree of paralysis-treatment; and it has come to stay. Only infantile paralysis itself will perhaps see less of it than other kinds, as paralysis after meningitis or by trauma, for it must be remembered that poliomyelitis very seldom, hardly ever, attacks one nerve wholly and solely, but only parts of one nerve, or parts of different nerves. The central part in the anterior horns is attacked, not the peripheric nerve. To give nerve transplantation that position in our plan of healing which it is perhaps entitled to, one chief question has to be answered first, and that is: What is the topographical anatomy of a nerve? Where in a section, in a crosscut through a nerve, lie the motor fibres for the different muscles, where the sensitive ones in relation to the body, so that we may know which part to replace, which one to take for grafting without undue harm. Until this anatomical question is completely answered, nerve transplantation in cases where the *whole* nerve is *not* affected, is merely guesswork and a matter of chance and luck.

In passing, I will mention these cases of purely lengthened muscles about which you heard a good deal in the discussion of the case I brought under your notice at our last meeting, when one gentleman attributed the work of that calf not to the transplanted peroneal and toe flexor muscle, but to the old gastrocnemius and soleus which had regained their old tonus, thus holding me up as a very queer and bad observer, who could not notice in six years what took him just as many minutes or seconds to realize. I could show you, however, that his remarks and theory were not borne out by the facts, the tendo achillis remaining soft all the while. In reality these cases with only lengthened muscles do not belong to the category of paralysis, as they are only paretic—that is, not paralyzed at all, but only diminished in their contracting power. They answer the will, they respond to the electric current. They originate in this way. A foot, for instance, has been struck down. By its weight it drops into equinus position, the muscles becoming lengthened. Now, during the next six months recovery of all muscles takes place slowly and by degrees. The muscles are weak; without exercise they never become strong—not strong enough any way to pull the foot up into its normal position. So they remain. When such a muscle is examined its active contraction will sometimes not move the foot at all; but if the care ful surgeon will place his finger on the tendon he will feel it swell distinctly under his finger, he will notice the flesh become harder, when he tests the belly. In these cases, of course, which, be it said again, are not paralytic, but simply paretic, shortening of tendon is sufficient to regain the normal function. (Only last week such a case came under my notice, when I could demonstrate these facts mentioned to one of you.)

But what is to be done in cases with very few or no muscles left? The answer is: Albert's arthrodesis, the stiffening of joints. I myself have tried to fix the affected joints by artificial ligaments. I crossed silk strings across the knee, hung the foot up by two silk cables from bone to bone. There is no difficulty in healing in the silk. The cord surrounds itself soon with layers of connective tissue, like a cable, of which the silk forms the centre. But this support cannot be made strong enough, the silk stretches, the joint becoming loose again. Thus the only method is the actual stiffening, the artificial ankylosis, either with silver nails and staples or with bone or ivory pegs. The strictest observance of a most minute asepsis in all these operations goes without saying. The bandage in plaster of Paris is kept for six, eight or twelve weeks, according to the operation.

A side issue, not intended, but none the less welcome, is the disappearance of the cyanosis in the operated limbs. The parts, blue and cold before, often covered with chilblains, attain a pink color and normal warmth. The cut and its healing create new blood vessels, providing better nourishment and temperature, just as Talma's operation of stitching the omentum in pockets of the abdominal wall in cases of cirrhosis of the liver with ascites opens up an outlet for the blood collecting in the abdomen.

These are the means we have at our disposal today to aid the deformed, the cripple. I trust to convince you presently that we are able to do a great deal, that we can almost every time succeed in bringing the paralyzed one on to its feet again, provided the paralysis has not become too general, to take away from him that hateful contrivance the crutch. He will be able to stand, have his hands and arms free, will be put on a road to earn his own living instead of being dependent on depressing charity and the pity of his fellow men, which must needs make him hateful to himself. From a burden to himself and others he will grow into a useful member of society.

For the slides I have chosen cases with results of several year's standing.

Slides. 1. Pes equino-varus dexter paralytic: paralyzed Peronei, extensor digit long. Op., 1905. Transplanted: Ext.

hall. long: division of tib. ant. Result: Perfect use of the foot. The young lady came out at a dance the other day.

2. Pes varus paralytic through trauma (fall upon a broken bottle), severing the peroneal nerve on the head of the fibula. Suture tried by other men; a firm scar made further trials in that direction impossible. Par.: Tib. ant., ext. hall. long., ext. digit. l., peronei. Op., 1904. Transpl.: Tib. post., flex. hall. long; flex. digit. long. Perfect results.

3. Inf. paralysis. Paral.: both extensores crurum, both tib. ant.; incapability of standing and walking. Op., 1906. Transpl. in knees: biceps and semimembranosus; extensor hall. long in feet. Result: Perfect.

4. Inf. paralysis. Pes equino-valg., paral. tib. ant. Op., 1907. Transpl. exten. hall. long. Result: Standing on the operated foot alone.

5. Inf. paralysis. Paral.: ext. cruris d., right foot totally. Op., 1906. Usual transpl. in knee; arthrodesis of foot (ankyosis of articul-tala-calcanea and calcaneo-cuboidea).

6. Total inf. paralysis of left foot; pes valg. paral. d. (—tib. ant.). Op., 1907.

7. Total inf. paral. of right leg; arthrodesis of knee and foot. Op., 1905.

8. X-ray arthrodesis of knee—total ankylosis.

9. X-ray arthrodesis of foot.

10. Paral. of right arm (Erb's point), paral. delt. biceps bracch. int., sup. long. Op., 1906. Arthrodesis of shoulder, transpl. of triceps. The formally useless arm is brought back to work; the lady works as typist.

Arthrodesis of shoulder, X-ray.

11. Transpl. in other but paralytic cases. Op., 1908. Severe case of juvenile polyarthritis rheumatic, incapability of walking on account of grave knee contractures. Knee transplantation to break down the overwhelming power of the flexors and strengthen the extensores crurum, which suffer severely in all disease of the knee.

All the results being perfect.

If a nursing child suddenly begins to suffer from indigestion, vomits and does not increase in weight, it probably does not get enough to eat.

SOCIETY TRANSACTIONS

Conjoined Meeting of the Associations of American Orthopedists and Pediatrists, Washington City, May 4, 1910.

Experimental Epidemic Poliomyelitis and its Relation to Poliomyelitis in Human Beings, was discussed by Dr. Simon Flexner of the Rockefeller Institute for medical Research, New York, who said that in the last few months it has been demonstrated with certainty that a disease agreeing in clinical type and pathological features with anterior poliomyelitis could be produced regularly in certain of the lower animals. The knowledge of this disease has been greatly extended by this transmission, and the hope of final conquest lies along the direction of this experimental work. The transmission has been accomplished only in connection with the higher animals, namely, monkeys, and with anthropoid apes and the lower species of monkeys. It is merely necessary to bring portions of the spinal cord of an affected human being, who has succumbed to the disease before it has become chronic, into relationship with the central nervous system of the monkey, to cause infection to occur. He and Dr. Lewis employed the spinal cords from three children who succumbed to the disease in the first week or two of its existence, and inoculated them directly into the brain of the animals. The monkeys had been anaesthetized and there was no discomfort, and they quickly recover from the operation and remain well for a variable period of time afterwards. Then after the expiration of this period, which is calculated as the incubation period, they come down with symptoms comparable in all respects with the human disease. It is also possible to transmit the virus in other ways. It may be introduced beneath the skin and mucous membrane; in the peritoneal cavity; subcutaneous tissue, or circulation; but these means are less certain than direct inoculation into the nervous system. By direct inoculation the disease can be produced in 90 to 100 per cent. of the monkeys employed. The spinal cord of these animals is just as infectious as the original human cord. As to just what the infectious agent is has not yet been demonstrated. That the active agent is a virus must be assumed from the fact that the transmission can be made over an indefinite period of time. One one-hundredth of a cubic centimeter of a filterate introduced into the nervous system in the manner described, produces the disease without exception. The indications are that the active agent belongs to the class of filterable viruses, the organism not being demonstrable even under the ultra-microscope. The virus has not been cultivated with certainty outside of the body up to the present time. Experimental poliomyelitis is a highly fatal disease in monkeys. Dr. Flexner emphasized the fact that the experimental disease is not only identical with the disease in human beings, but also that the effects of it are much more intense upon these animals than upon human beings. Experiments showed that the virus was excreted through the nasal and pharyngeal mucosa; hence the mucous membranes of the nose and throat contained the virus. These mucous membranes become infected because of their proximity to the meninges of the brain, and it is probable that they are the foci of primary infection, and if they prove to be, a means for practical preventive measures is indicated. The intact mucous membrane of the nose in the monkey is not subject to infection with the virus, but a small degree of traumatism exposes it to infection, and leads to transmission of the virus to the central nervous system. The virus travels readily from the mucosa of the nose to the meninges. One attack of the experimental disease affords immunity against subsequent inoculation. The blood serum of these animals is capable of neutralizing the virus, and the blood of children who have recovered is also capable of such neutralization. Dr. Flexner expressed the hope that it will be possible to bring about such neutralization in individuals sick with the disease, though this has not been proven to be possible in man. Monkeys already infected can be protected from developing the disease by subdural injection of such immune sera. The situation is therefore a hopeful one for specific therapy. Since the disease is a more virulent disease in monkeys than in man, and it has been shown to be possible to interrupt the disease in them, it would seem that a similar result should be achieved in human beings. No evidence of direct communicability of the disease was obtained from the experiments on the monkeys, although the evidence of communicability is strong in the case of human beings.

Paralysis of the Neck and Diaphragm in Poliomyelitis. —Irving M. Snow, M. D., Clinical Professor of Diseases of Children, Medical Department, University of Buffalo. The writer states that the existing literature on this subject is very scarce. Neck paralysis in combination with loss of power in the extremities is not unusual; on the contrary, isolated neck palsies are excessively rare in poliomyelitis. Paralysis of the diaphragm is scarcely mentioned in treatises on poliomyelitis except with the fatal type of Landry's paralysis.

There is but one recorded case (*Erb*: *Deutsch. med. Wochenschr.* 1906, p. 1899) of a combined paralysis of the phrenic and spinal accessory nerves existing as the sole lesions of a high cervical poliomyelitis. The origins of the spinal accessory, and phrenic nerves are close together on the upper cervical cord. The spinal branch of the spinal accessory originates in the anterior horn of the cord, as low as the sixth cervical nerve. It is simply a motor spinal nerve which has the usual course of ascending into the skull and of leaving it again with a cranial nerve. In the neck the spinal accessory inosculates, with the second, third and fourth cervical nerves and forms a plexus which innervates the sternomastoid and the trapezius muscles.

The phrenic nerve—fourth cervical-nerve-arises from about the same tissue and innervates the diaphragm. Thus the two pairs of nerves originate in about the same area of spinal gray matter, and a focus of inflammation in the cervical cord might easily injure the functions of both phrenic and spinal accessory nerves.

The rarity of paralysis of the phrenic nerve may be due to the resisting power of its tissue to disease. With paralysis of the neck muscles the symptoms are characteristic. The patient cannot rotate the head, hold it erect or raise it from the pillow. In sitting or standing, the head falls forward, backward and sidewise, not following the movements of the body; the head wabbles around on the body like the head-piece of a disabled marionette.

Wickman, (*Heine-Medinschen Krankheit*, p. 34) says that the pathologic disturbances of the mechanism of respiration in poliomyelitis are partly due to an affection of the spinal center of the intercostal muscles and diaphragm, and partly to a lesion of the origin of the vagus nerve. It is not always possible to distinguish whether the respiratory distress comes from a high cervical or a pontine source. An injury to the pneumogastric of medullary origin usually shows itself by recurring attacks of dyspnea and tachycardia.

With an isolated bilateral paralysis of the diaphragm the symptoms are usually very clear. The respiratory abdominal movements are the reverse of normal. In health during inspiration of abdominal viscera are depressed and the abdomen is protruded. With a diaphragmatic palsy the upper abdomen recedes during inspiration and is pushed out during expiration. Breathing is labored and difficult. Any effort causes cyanosis and dyspnea. The lungs are nevertheless clear of pathologic sounds. The prognosis is always serious, partly from the danger of pulmonary infection, and is especially grave if associated with bulbar symptoms. If the paralysis of the diaphragm is complicated with a loss of power of the intercostal muscles the patient will probably suffocate. This danger is greatest in the first week, after which time the outlook improves.

REPORT OF CASE

The history of my case of cervical poliomyelitis causing paralysis of the neck and diaphragm is as follows:

Patient.—John D., was a boy of four, a patient of Dr. Villiaume. Previous to his illness a baby brother, breast-fed, had sickened August 29 with fever, vomiting, diarrhea and general tenderness and died in a few days; and a cousin, also in the same house was attacked with symptoms of meningitis and taken to Ohio. Both these were probably cases of poliomyelitis spreading by direct contagion. John D. sickened September 4, with pain and tenderness in the limbs, trunk and neck, vomiting, fever, 104, pulse 150, and retention of urine. Later the pain and tenderness lessened, but there was still soreness and muscular twitching in the limbs, and in a day or two a flaccid palsy developed in the muscles of the neck. There were no convulsions; the boy was slightly delirious at times.

Examination.—I saw the patient first September 8, the fifth day of the disease. He was a well-developed boy, lying in a reclining chair, breathing with great difficulty. The pulse was 110, regular; respiration 42. The lungs were clear; there was a complete paralysis of the neck muscles so that the patient had no control of his head. The head fell backward and forward and sidewise unless held with the hands or resting on a pillow. The neck was not tender. Its muscles did not respond to the galvanic or faradic current. Evidently there was present a paralysis of both spinal accessory nerves injuring the function of the sternomastoid and trapezius muscles. Most of the child's distress arose from difficulty in breathing. The whole chest moved with great effort during respiration. With inspiration there was slight recession of the anterior ribs and the upper abdomen was drawn in; it bulged out at expiration, indicating a bilateral paralysis of the diaphragm. The right knee-jerk was absent, the left normal; sensation was normal.

Course of Disease.—In the evening there developed great cardiac depression, rapid pulse and intense dyspnea, giving rise to the fear that the myelitis had invaded the medullary tract. This distress passed away in a few hours. After this for ten days the child remained in stationary condition and was fairly comfortable except that the respiration was labored and rapid and that the neck muscles were useless.

September 17: Fourteenth day of illness. Dr. James W. Putnam in consultation. There was no fever; respirations 40, pulse 120 to 140. The face was often flushed; the pupils were evenly dilated; the lungs were clear; the heart sounds good. The neck muscles were still paralyzed; did not respond to faradism. The abdominal muscles responded to faradic current; the upper abdomen receded at inspiration. Evidently the condition was due to a high cervical poliomyelitis affecting a focus at the origin of both pairs of phrenic and spinal accessory nerves.

October 21: Forty-seventh day of illness. There had been general improvement since last mentioned date. Respirations were 31; pulse 96 Both knee-jerks were lost. Respiration was easy and normal. The abdomen bulged at inspiration; the abdominal reflexes were good on both sides. The head could be moved rather feebly from side to side and also drawn forwards. The sternomastoid was partly restored. The head could not be moved backwards. There was no power in the trapezius; all the neck muscles wasted and flabby; all twitch with the galvanic current.

The paralysis of the diaphragm began to improve after the third week and had disappeared by the sixth week. The child improved rapidly in health. A jury-mast support enabled him to support his head. About March 1, the jury-mast support was discarded and the child played about without artificial support to his head. All of the muscles of the neck could be moved, although the sternomastoid was still somewhat weak. There was no apparent wasting of any muscle. The course of the disease showed that the myelitis affected a small focus in the cervical cord between the third and sixth cervical nerves, temporarily destroying the function of both phrenic and spinal accessory nerves; the lesion about the phrenic nerve caused a severe but temporary disturbance of respiration. The paralysis of the neck muscles lasted about four months, after which time both sternomastoid and trapezius recovered their power.

The treatment.—Protection from chill and respiratory infections, rest, diet, strychnin, electricity—was skillfully carried out by Dr. Edward Villiaume.

From the meager literature of paralysis of the neck and diaphragm in poliomyelitis the writer concludes that cervical poliomyelitis affecting only the origins of the phrenic and spinal acessory nerves is rare, but in the two recorded cases recovery occurred.

That paralysis of the neck muscles occasionally occurs in poliomyelitis and except in Landry's paralysis the prognosis is favorable as to restoration of function; some improvement always takes place.

That paralysis of the diaphragm is exceptionally seen in poliomyelitis and that, although dangerous, recovery is possible.

Infantile Poliomyelitis; its Relation to the Community in Reference to Etiology and Prevention.—Robert W. Lovett, M. D., of Boston, said that the medical profession of today was confronted with the task of making a new literature upon the subject of infantile poliomyelitis; so rapid has been the recent progress of our knowledge in regard to this disease, that the writings of five years ago were now largely out of date and that the standard text books do not, naturally, present the latest teachings. He then referred to immunity and the experimental production of poliomyelitis and dwelt particularly upon the aspect of the disease as it affects the community. He thought the orthopedic men who have to repair the damage done would be anxious to join the pediatrists in fighting this malady. He stated that it was one of the most infectious diseases and unquestionably on the increase. It is serious enough to warrant greater attempts on the part of health authorities to investigate the conditions under which it occurs. The generally accepted belief that infantile paralysis is becoming more common and more wide spread of late years, is due, perhaps in part, to the fact that the disease is better known and more frequently recognized. He next spoke of the result obtained in Massachusetts last year during an epidemic in which nearly 1,000 cases were reported. The speaker said: A consideration of the distribution of the disease in the State of Massachusetts for the past three years shows that in all three years the disease occurred in scattered foci in all parts of the state, but was more frequent in the river valleys than away from rivers; that a case rarely occurred in a town without one or more cases in contiguous towns, and that localities severely affected one year were lightly affected the next, *e. g.*, the outbreak in the upper Connecticut Valley in 1908 was followed by very few cases in 1909 in that region. In the next year but one, however, localities markedly affected may again show many cases, *e. g.*, in 1907 the extreme western end of the state showed many cases, in 1908 almost none, and in 1909 again many cases. The Metropolitan District shows, of course, a large number of cases, and it will be noted that in general there were more cases of the disease in the town north of Boston than in towns south of it.

In referring to the mortality he estimated that from five to twenty per cent. of cases were fatal. Of the cases that survive over 80 per cent. are permanently paralyzed and many crippled for life.

The recognition of outbreaks of infantile poliomyelitis was of recent date. Bergenholz, a Swede, writing in 1881, was the first to recognize and describe an outbreak with sufficient accuracy to make it acceptable. Since that time, outbreaks have been reported with increasing frequency. From the time of the first reported outbreak until the close of 1909 had been thirty years,—during which time some 69 outbreaks have been reported. The outbreaks in the United States during the past five years, showed that it had not been a local condition, Minnesota with 700 cases; Nebraska with 619; Kansas 80; Masachusetts 1,000; New York 2,500 which accredits this country with more than half of the reported cases for the entire world. The increase in outbreaks in the past five years is not explained by an increased interest in the disease. There were more reported cases in cold than in warm countries.

The speaker advocated house to house investigation of all outbreaks by competent men, reporting directly, through the attending physicians, to Boards of Health. In a report of 150 carefully studied cases, occurring in 142 families, showed the probable existence of a fairly large number of abortive cases assocaited with them. Of the 142 families investigated 134 had vermin, and 87 had pet animals,—birds, cats, dogs, etc. The evidence of communicability in our series of cases is a very important matter. We had instances of direct contagion, from child to child with an incubation period of from one to fourteen days. We had a number of instances of what appeared to be indirect contagion by a healthy carrier, and finally we had 11 instances in the 150 cases where the disease followed intimate contact with persons with old infantile paralysis, often of many years standing. Instances of what would appear to have been contagion occurred in 35 out of the 150 cases. Of the 150 cases 62 were swimming or wading in stagant water just before the onset. It is important to note that out of the 150 cases reported not a single child, living on breast milk alone, was attacked by the disease. Of the 150 cases carefully studied 35 were attending school at the time of onset. It was also observed that possible conditions favoring preceding or attending the infection of the 150 cases studied, that 93 had suffered from some solution of the continuity of the skin, such as bites from insects, bee-stings, slight wounds or abrasions of the epidermis, sore throat, diarrhea, otitis media, coryza, measles, et cetera. The other 57 cases had no such history. Most of the 150 carefully studied cases occurred in old houses—15 occurred in houses under five years old and 135 cases occurred in houses which had been built from ten to thirty years. Maps prepared by the State Board of Health of Massachusetts showed the distribution of the disease there. One hundred and thirty-six cities and towns were listed, according to the prevalence of the disease. Boston was shown by districts. Density of population seemed to have nothing to do with the distribution. There were 48 abortive cases. More males than females were affected. Only seven per cent. occurred in the first year of life, but 87 per cent. in the first ten years.

In the matter of prevention of the disease in Massachuetts in November, 1909, it was made one of the notifiable diseases, like scarlet fever, etc. In a recent circular addressed to physicians it has been advised by the board that such cases should be quarantined and that urine, stools, and sputum should be disinfected, and we have called attention to the existence of abortive cases as probable sources of contagion. Of the 150 cases carefully studied 16.7 per cent. are known to have recovered, and that a study of a character of onset, distribution and tenderness in these cases gives no means of distinguishing them from other cases at the time of attack. No conclusions were drawn from the investigation, the report being entirely a preliminary one, but the writer thought that if the investigation of the disease by health authorities was to be continued it was to be so indicated by the representatives of the societies present.

The Clinical Aspects of Poliomyelitis; Types; Communicability; Mortality.—L. Emmett Holt, M. D., New York, referred to the alarming increase of epidemics of the disease. He said the infection, starting in Europe, was spreading over this country and probably over the entire world. He believed there was no essential difference between the two forms of the disease, except as to communicability. The analogy to cerebro-spinal meningitis was striking. Virulence was greater when the disease was epidemic, but otherwise they seemed identical. The disease varied in severity in different epidemics. Death rate in sporadic cases was much lower than in the epidemic cases. The proportion of abortive cases could not be estimated at present, but it was probable that the number is quite large. Several cases of transmission by a third party were cited. He believed that the disease is contagious and under certain conditions highly so, demanding in epidemic forms a strict quarantine. Healthy persons might be carriers of the infection. Contact with persons suffering from the disease, or associated with it, was the medium of infection. The disease seemed to vary as to its communicability at different times. The writer believed that a new name should be sought for the disease as the term used was not exact, inasmuch as it is not limited to the anterior horns, nor indeed to the cord itself. He suggested the name epidemic myeloencephalitis.

H. Winnet Orr, M. D . of Lincoln, Neb., in reporting the 1909 epidemic of poliomyelitis in Nebraska cited 619 case, principally in Polk and York counties.

Dr. Orr said Polk County had 238 cases with a death rate of 14 per cent. During the months of June and July (1909) there was 500 cases. Quaratine reports were unsatisfactory. Of the recoveries 75 per cent were paralyzed. Males and females about equally affected. The epidemic was confined principally to children, more than 75 per cent being under 10 years of age. Dr. Orr's report was well received and will appear in full in the Journal of the American Orthopedic Association.

The Royal Society of Medicine, Section for the Study of Diseases of Children

Polioencephalomyelitis the Cause of "Acute Tremor" in Children —By Leonard Parsons, M. D., M. R. C. P., Honorary Pathologist, Queen's Hospital, Birmingham; late Casualty Medical Officer, Hospital for Sick Children, Great Ormond Street, London; *British Journal Diseases of Children.* Dr. Parsons stated the fact that the acute infective process which attacks the cells of the anterior horn of the spinal cord, and which has therefore been called acute anterior poliomyelitis, is not limited in its action to those cells, is now generally recognized, and the condition is more correctly spoken of as acute poliomyelitis. It is not, however, so generally recognized that this morbific agent can affect higher levels in the nervous system, resulting in a polioencephalitis. The two conditions may occur together: polioencephalomyelitis, a cumbersome but expressive term. Flexner and Lewis have proved experimentally that these two conditions are manifestations of the same disease. Using the cord of a child who died from acute poliomyelitis, they were able to reproduce in a monkey identical lesions, not only in the cord, but also in the medulla. They have also found in monkeys, in which they reproduced disease, changes in the intervertebral ganglia, similar to those present in the spinal cord and brain in every case in which they have been looked for. Indeed, our conception of this disease must be that it is very general throughout the nervous system, attacking especially the gray matter and producing widespread results, some of which are temporary and completely clear up, others—the residual palsies—where actual destruction has taken place being permanent.

Polioencephalitis presents a symptomatology which varies greatly with the part of the brain chiefly affected. Thus, if it affects the cerebral cortex, convulsions, infantile hemiplegia mental deficiency, and epilepsy may result. If the mid-brain, nuclear palsies of the nerves which arise in that region, III, IV, also lesions of the red nucleus and its connections, producing the characteristic symptoms to be described later. If the pons, nuclear palsies of V, VII, etc. In the cerebellum, frequently there develops a wild ataxia, the "acute ataxia" of Leyden, accompained by hypotonus of the muscles, and possibly nystagmus. In this paper I wish to refer to polioencephalitis affecting the cerebello-rubro-spinal system. The condition was first described by Miller in a recent number of *Brain*, under the title, "On Certain Cases of Acute Tremor occurring in Children." I wish to place on record three additional cases, and refer also to a fourth case which came under my notice and which is included by Miller in his series.

The cerebello-rubro-spinal system is motor in function, and consists of two parts—the cerebello-rubral and rubro-spinal. The former links the dentate nucleus of the cerebellum with the red nucleus of the opposite side *via* the superior cerebellar peduncle, and in the latter the red nucleus is connected by the tractus rubro-spinalis, or Monakow's bundle, with the opposite side of the spinal cord. There are therefore two decussations in this system, and they both occur in close proximity to the red nucleus. In its course through the pons Monakow's bundle passes close to the seventh nerve nucleus, whilst in the cord it is closely related to the pyramidal tract. The red nucleus itself is developmentally a portion of the thalamencephalon, and its anterior end projects within the usual anatomical limits of the thalamus; posteriorly it extends so far into the mid-brain that the roots of the oculomotor nerves either pass through it or are in close proximity.

Gordon Holmes has shown that a destructive lesion of this system produces a slow, coarse, regular tremor of a rate 3-5 per second. It is involuntary, can only be checked for the shortest space of time, and volitional movement of the affected limbs is complicated by an irregularity of the intention tremor type like that met with in disseminated sclerosis. He has also pointed out that combined with this tremor is a certain degree of paresis and rigidity; in fact that there is a close resemblance to the classical symptomatology of paralysis agitans.

From what has been said of the distribution of this system it follows that if the tremor is due to destruction of any part of it, the movement will be on the same side as the lesion, unless the red nucleus or its immediate neighborhood be affected, when the tremor will be contralateral.

In the series of cases about to be described and in Miller's series the symptoms present agreed with those pointed out by Holmes. To use Miller's words: "The tremor which, with its acute onset is characteristic of these cases, corresponds exactly with that described by Gordon Holmes. It is a slow, regular tremor, in rate about five per second, which at its worst is continuous except during sleep, although increased by voluntary movement or during periods of excitement. It may be universal in the head, tongue, and muscles of the trunk, abdomen and limbs, and it is sometimes more definite in the proximal than in the peripheral parts of the extremities. In some of these cases the appearance of the child is very like that of one shivering all over from cold. Combined with the tremor is hypertonus, giving to the limbs some degree of uselessness, and rendering their movement slow, stiff, and awkward, and this in the absence of true spasticity. The important symptoms are three—the acute onset, the tremor, and the hypertonus. The two latter serve to separate the condition from cerebellar encephalitis in which there is hypotonus and ataxia, possibly also nystagmus and scanning speech." Other signs and symptoms that may be present in these cases are those due to the disease attacking other parts of the brain and cord, and also from involvement of parts of the brain in the immediate vicinity of the cerebello-rubro-spinal system, *e. g.* oculomotor, VII nuclei, etc.

REPORT OF CASE.

F. A., a girl, aged two years and three months, was at play, apparently quite well, on the evening of July the 15th, 1909. When put to bed it was noticed that she was feverish. At 10 p. m. she had a "fit," in which she became stiff and unconscious, but there was no twitching; this lasted about fifteen minutes, and soon afterwards she fell asleep. Immediately after waking up at 10 a. m. the next morning she had another "fit," after which she slept till 12 noon, when yet another "fit" occurred. On recovering consciousness she said "Oh," and it was noticed that she was trembling all over, the tremor affecting the tongue, arms, legs, and trunk, and was exactly like shivering. It was markedly less (if present at all) during sleep. For nearly three weeks she remained in bed, during which time the tremor persisted, she was apparently conscious, took her milk, but her eyes were fixed and staring, and she did not appear to see anything, nor did she speak. At the end of the first week after the onset of this illness pneumonia developed. She was admitted to the Hospital for Sick Children on August the 2nd, under Dr. Garrod, to whom I am indebted for permission to publish her case.

The family history showed nothing of note. She had been a quick and intelligent child up to the onset of the illness, and was able to talk quite well. On admission there was slight retraction of the head, her expression was staring, and she was apparently quite blind. There was present a slow rhythmic tremor of the arms, its character being that described previously, associated with which was well-marked rigidity of the limbs, but with no evidence of paresis. The knee-jerks and abdominal reflexes were present, and the plantar responses were of the flexor type. Both pupils reacted to light, *i. e.*, the reflex arc was intact, and the fundi showed no changes. There was also well-marked broncho-pneumonia.

On August the 13th the temperature fell to normal, and the chest signs soon cleared up. The tremor had been present continuously except during sleep, and on this day the tongue was seen to be affected. The cerebrospinal fluid was examined on the 19th, and no lymphocytosis or organisms were found. Von Pirquet's reaction was negative. About the 24th the child spoke for the first time since July the 16th, and it was noticed that her sight had returned. On the 26th she was able to sit up, but on doing so the characteristic tremor appeared not only in the arms, but also in the trunk and legs, *i. e.*, voluntary movement had caused its return in those parts. On September the 4th the tremor was absent when the limbs were at rest, and only brought out by voluntary movement. She made her first attempt to walk on this day. From then until she left the hospital on September the 12th the tremor improved, returning less and less on volitional movement. It was noticeable for the longest period in her arms, and at the time of her discharge had not entirely disappeared when voluntary movements were undertaken. There was also considerable stiffness of the limbs remaining. At no time was there any nystagmus or change in either ocular fundus.

She was last seen on February the 8th, 1910, when she appeared quite well and talked freely. Her mental condition was fair, possibly not quite so good as before her illness. She was still rather slow and stiff in her movements, and after a considerable amount of voluntary movement or excitement a slight tremor appeared in the left arm, affecting chiefly its upper part.

The lesion here probably not only affected the red nucleus or its connections, producing the tremor, but also the cerebral cortex, more particularly the occipital cortex of both sides, since transient blindness, convulsions loss of speech, and possibly some loss of mental power, were present.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

EDITED BY

KARL H. GOLDSTONE, M. D.

Physician to the Children's Clinic, Mt. Sinai Hospital, New York City.

Does an Attack of Epidemic Poliomyelitis That is Recovered From Afford Immunity to Reinfection?—The authors, Flexner and Lewis in *Archives of Pediatrics*, state that experimental poliomyelitis in monkeys is a very severe disease and, in our series, it has produced death in fully 40 per cent. of the inoculated animals that have developed paralysis. When recovery occurs, residues of paralysis persist; and when death occurs, or where the animals are killed some weeks later, atrophy of the gray matter of the spinal cord, corresponding to the paralyzed limbs, is present. We have reinoculated several of the recovered monkeys and have noted in some instances failure of the virus to act while causing paralysis in the control monkeys. A single example will be given.

Monkey 45 was inoculated into the brain on November 6, 1909. November 13th, tremulous and sick; November 15th, left leg weak; next day the leg is paralyzed; November 24th, general health good, but paralysis persists; November 30th, health excellent except for paralysis. On this day reinoculated together with two controls. Both of the latter became paralyzed, but the reinoculated animal has remained well.

Can the Course of an Intercerebral Inoculation be Modified by the Simultaneous Injection Beneath the Skin of a Virus Altered by Heating?—In seeking for facts relating to artificial protection from, or resistance to, infection, a considerable quantity of an emulsion of active spinal cord, which had been warmed to 55°-57° C. for one hour, or to 60° C. for one-half hour, was injected beneath the skin at the same time that a usual intracerebral injection of virus was given. The two monkeys employed in the experiment developed paralysis in the usual manner.

We have studied the mucous membrane of the nasopharynx with reference to the virus of poliomyelitis. The entire mucosa of these parts, in monkeys recently paralyzed, has been excised, rubbed up with quartz sand, pressed through a bacteria-tight Berkefeld filter, and injected in the usual manner into the brain of monkeys. By employing this method, we have been able to produce paralysis and thus to prove that the mucous membrane contains the virus of poliomyelitis. We have also found that when the virus is injected into the spinal canal by lumbar puncture it sets up the disease and causes the characteristic paralysis. The cerebrospinal fluid removed from monkeys at the onset of paralysis is altered; it contains an excess of proteids and lymphocytes and coagulates spontaneously. Paralysis also follows the inoculation of this fluid into the brain.

These experimental results show that a path of elimination of the virus of poliomyelitis is by way of the nasopharyngeal mucosa and indicate that the same path may be traversed in the course of infection. Hence it would seem desirable, at the present stage of our knowledge, to deal prophylactically with epidemic poliomyelitis, as with epidemic cerebrospinal meningitis, by disinfecting and destroying the secretions of the nasal and buccal cavities.

Brief mention should be made of other species of animals that have been employed for inoculation. Besides many guinea pigs and rabbits, one horse, two calves, three goats, three pigs, three sheep, six rats, six mice, six dogs, and four cats have had active virus introduced in the brain, but without causing any appreciable effect whatever. These animals have been under observation for many weeks.

In the literature on epidemic poliomyelitis in human beings, reference is made to sensory cutaneous disturbances. In every instance in which we have looked for them we have found lesions, similar to those in the spinal cord and brain, in the intervertebral ganglia obtained from the paralyzed monkeys.

It need hardly be pointed out how much our knowledge of this severe disease has been extended in a few months by the employment of the experimental method in its study.

Transmission of Acute Anterior Poliomyelitis to Monkeys.—An advance in the study of this disease has been made by the experiments of Simon Flexner and P. A. Lewis (*Jour. Amer. Med. Assn., Amer. Jour. of Obstetrics.*) Working with emulsions in salt solution of the spinal cord of fatal cases in children and subsequently of the monkeys injected with this, they have shown that the virus of epidemic poliomyelitis is readily transmissible from man to monkeys and from monkey to monkey, by way of the brain, the peritoneal cavity, the sciatic nerve, the subcutaneous tissue, and the circulation, and that, however transmitted successfully, it becomes established in the spinal cord and medulla, where it sets up characteristic lesions which are followed by equally characteristic effects that exhibit themselves as the usual symptoms of infantile paralysis in human beings. This experimental form of poliomyelitis in monkeys is a severe and very often fatal disease, and when recovery from the disease takes place there persist residues of paralysis which resemble the paralytic effects also persisting in human subjects of poliomyelitis. They have shown also (*Jour. Amer. Med. Assn.*, December 18, 1909) by suspension in glycerin of the comminuted cords of monkeys affected with poliomyelitis, and by filtration through a Berkefeld filter before injection into other monkeys, that probably the infecting agent of epidemic poliomylitis belongs to the class of the minute and filterable viruses that have not thus far been demonstrated with certainty under the microscope. The fact has been determined that the virus of poliomyelitis can be transferred to the central nervous system by way of the subcutaneous tissues in monkeys.

To determine whether an attack of epidemic poliomyelitis followed by recovery will afford immunity to reinfection, the writers (*Jour. Amer. Med. Assn.*, January 1, 1910) have reinoculated several of the recovered monkeys and have noted in some instances failure of the virus to act while causing paralysis in the control monkeys. An attempt to modify the course of an intracerebral inoculation by the simultaneous injection beneath the skin of a virus altered by heating was a failure.

Treatment of the Onset of Acute Anterior Poliomyelitis.—Feeling that an effort should be made to control this disease before the appearance of paralysis, Le Grand Kerr (*L. I. Med. Jour.*, Nov., 1909) thinks that during the course of an epidemic all cases of indefinite illess in children under five years of age, especially if fever, diarrhea, cough, and vomiting are present, should be treated as positive cases of this affection. He has employed tentatively for this purpose a hot pack, administration of water freely by mouth even if vomiting is increased thereby, a hot enema followed by a large dose of castor oil, and rest in a quiet and darkened room, restriction of diet, and the use of belladonna and ergot in full doses.

A Case of Late Scoliosis in Infantile Paralysis.—(*Gaz. des Hop.*, July 1, 1909, p. 943, *Brit. Jour. Diseases of Children.*) R. Gaultier and D. Baisoin relate the following interesting case: The patient a man of thirty two, had suffered from acute poliomyelitis at the age of eighteen months; this left him with a considerable atrophy of the left lower limb. At the age of sixteen he suddenly began to show a spinal curvature, which rapidly progressed for five months. It was most marked in the dorsal region, and the convexity of the curve was to the right. The authors discuss the diagnosis, eliminate juvenile scoliosis and static scoliosis secondary to the limb deformity, and conclude that the curvature was due to weakness of muscles affected by the infantile poliomyelitis. Other cases of the kind are known of.

Muscle Training in Anterior Poliomyelitis.—John M. Brery and Bertha van Denbergh, writing on this subject in the April issue of (*Albany Med. Annals*), assert that the treatment of the acute stage of anterior poliomyelitis is symptomatic, combined with rest in bed and measures to relieve the congestion of the spinal cord. Some authorities advocate rest in bed for six weeks or more. As the acute symptoms subside, attention is directed to the paralyzed area and measures are taken to maintain the nutrition of the muscles and prevent deformity. The nutrition of the muscles is maintained by massage. Muscle beating, hot air baths, electricity in various forms, etc. Each method or combination of methods has its more or less enthusiastic supporters. Deformity should be prevented by daily passive movements of the joints to the physiological limits in all directions. Later when the patients attempt to use their limbs deformities must be prevented by mechanical treatment. When, through the use of mechanical support, a disabled member is capable of function a great advance has been made; but treatment should not stop. Only too often the fitting of the patient with braces ends the treatment. Mechanical support should be only an adjunct or preliminary to muscle training.

When a patient begins to use his limbs he makes the movements which are the easiest. The action of the stronger muscles predominates and the muscles with only a little power remaining are not only not used but are constantly stretched and strained. As a result the weakened muscles tend to atrophy and degenerate still more and soon awkward and bad modes of action are acquired.

The object of muscle training is to develop and increase the efficiency of the partially paralyzed muscles thereby increasing the efficiency of the limb as a whole and at the same time preventing or improving the awkward and vicious habits of action. One of the first essentials is to get the confidence and co-peration of the patients, most of whom are children. They may be sensitive and humiliated by their awkward attempts to use the limbs and not trust their own powers; on the other hand they may be apathetic and not care to exert themselves. The best results are obtained when the treatment is started early, *i. e.*, before mechanical treatment has been attempted, but surprisingly good results can sometimes be obtained in old cases considered beyond improvement.

Voluntary movements, be they ever so slight, are of much more benefit in maintaining and building up nutrition in a muscle than passive motion, electricity or even massage. Electricity is probably more widely used in anterior poliomyelitis than any other agent. It is of undoubted value in maintaining the nutrition in muscles temporarily paralyzed, but as soon as a muscle regains any voluntary power voluntary movements are more efficacious. Slight massage, gentle manipulation, and light percussion are very stimulating to the growth of muscle and are usually more agreeable to the patient than the use of electricity. Heavy massage, manipulation or percussion, however, are detrimental and cause the weakened nuscles to atrophy still more.

The writers use light massage, gentle manipulation and light percussion to improve the circulation and muscle tone but lay stress upon training the patient to make voluntary movements. Sometimes the power necessary to a certain movement is present but the patient is unable to make the movement because he does not know how. For example: power of voluntary movement may be present in the extensor muscles of the leg and some little contractile power may be present in the flexor muscles, but the patient, by disuse, has lost voluntary control. When he is instructed to flex the leg the nervous impluse generated causes extension. He has to be assisted in the movement and after a time the association path in the brain will be re-established. Resisted movements sometimes bring out more voluntary control and are always excellent strength builders. Sometimes when a certain voluntary movement is absent in one limb but is present in the opposite limb it can be developed by instructing the patient to try and make the movement with both limbs. The nervous impluse seems to extend into the paralyzed limb and cause the movement which would be impossible if the effort were made with the weakened limb alone.

The muscle training must be of such a nature as to secure the interest and co-operation of the patient. Most of the patients are little children and the exercsies are given in the form of gymnastic play; the legs may be called little horses, the arms birds' wings, etc. Angular movements are given the preference because of the usually relaxed condition of the joints. The children are trained to do the various exercises carefully and correctly and with the limbs held in as correct a position as possible. They should not be tired. Twenty to thirty minutes every day or thrice a week is sufficient for any child. The instructor should stop each day's work when a small gain has been made so that the child will see that he is improving and not get discourged by fatigue and failure.

Acute Poliomyelitis (Infantile Paralysis).—Dr. H. Campbell Thomson in the (*London Practitioner*), states that with a better understanding of the morbid anatomy of this disease, the term "infantile paralysis" gradually became to a large extent, displaced by that of "acute anterior poliomyelitis;" while this latter, again, in its turn, has given way to a more comprehensive title of "acute poliomyelitis."

The first mentioned term, viz., that of "infantile paralysis" or "infantile spinal paralysis," as it has been variously styled, is obviously too limited a designation, since the disease is by no means confined to childhood. This latter fact has been recently emphasized by Farquhar Buzzard in his Goulstonian Lectures on "Acute Infective or Toxic Conditions of the Nervous System," in which he shows that on taking at random, from literature, 25 undoubted acute examples of this disease, 15 cases occurred under and 10 over the age of 20. These figures as he states, are calculated somewhat to surprise those who are in the habit of regarding this affection only as one of early childhood.

From observations of epidemics and of the general symptoms which accompany an attack, the infective nature uf acute poliomyelitis has long been suspected, though the exact nature of the infective agent or agents has hitherto been, and still is, a matter of great uncertainty.

An important addition to the bacteriological aspect of the question has lately been made in a paper embodying an account of some investigations carried on at the Middlesex Hospital by Dr. W. Pasteur, Mr. A. G. R. Foulerton, and Mr. H. MacCormac, in which a case of acute poliomyelitis was found to be associated with a dipococcal infection of the spinal sac. The symptoms and progress of the case, which was that of a boy aged thirteen years, were from a clinical point of view, in accordance with the recognized features of acute poliomyelitis, though there were some points especially worthy of notice, as, for instance, the paralysis of the diaphragm and of many muscles of the trunk. For a time the patient seemed in great danger of losing his life, but the subsidence of fever was followed by a general improvement in health, and, later on, by some degree of recovery of power, though the patient remains entirely crippled so far as any use in the lower limbs is concerned

The 1908 Epidemic of Acute Poliomyelitis in Vienna and Lower Austria (*Wien. med. Wochens.*, No. 46, 1909, p. 2683, *Brit. Jour. Chil. Dis*)—J. Zappert.—This paper, which contains the results of a collective investigation of the Pediatric Section of the Vienna Gesellschaft fur innere Medizin und Kinderheilkunde, is based on 266 cases, 137 of which occurred in Lower Austria and 129 in Vienna. The epidemic began in July, 1908, reached its height in September and October, and sank rapidly in January and February, 1909, but had not completely terminated by the following September. Most cases occurred during the second and third years of life. A large number of older children were affected but very few adults. The morbidity was higher among boys than girls. The dissemination of the disease did not appear to depend upon poverty or density of population. The cases are discussed according to the classification proposed by Wickman. The great majority belonged to the purely spinal form: 241 out of the 266 cases showed marked spinal symptoms. In most cases the legs were paralyzed. In ascending or descending form resembling Landry's paralysis occurred in 14 cases. Older children and adults were chiefly affected. Many instances of the bulbar and pontine form were met with. Affection of the cerebral nerves manifested by ocular and facial palsy and difficulty in swallowing was noted in 25 cases, and was associated with paralysis of the extremities. As a rule the bulbar and pontine symptoms disappeared entirely. Only a few cases of Strumpell's encephalitic form were seen. Zappert thinks there is no justification for creating separate classes for ataxic and polyneuritic forms. It was impossible to state the frequency of the meningitic and abortive varieties because the physicians in attendance were not familiar with the existence of these forms, but many cases were recorded in this epidemic of the occurrence of meningeal and indefinite febrile conditions. Twenty-six of the cases died, a mortality of 10.83 per cent. Some of the fatal cases showed signs of Landry's paralysis and other severe meningeal symptoms, while a few succumbed to intestinal catarrh and pneumonia. Complete recovery took place in 37 cases, or 13.8 per cent. This figure is only approximative since it does not take into account the abortive forms nor those in which recovery might occur later. In the epidemiological part of the paper it is shown that both in Vienna and in the provinces the cases were very unequally distributed There was often an accumulation of cases within certain districts or among groups of houses. In eight cases, two instances of which occurred in Vienna, children of the same family were affected. Zappert concludes that poliomyelitis may be regarded as an endemic infectious disease which has suddenly assumed the proportions of a severe epidemic; its behaviour thus resembles that of cerebrospinal meningitis.

So-called Acute Epidemic Anterior Poliomyelitis.—(*Semaine Med.*, November 24, 1909). Lhermitte discusses the reports of various epidemics of acute anterior poliomyelitis, and remarks that they do not all conform to a single type of disease. The reports include a number of inflammatory affections of the nervous system and meninges, such as simple or hemorrhagic polioencephalitis, diffuse encephalitis and myelitis, meningomyelitis, meningo-radiculitis, and polyneuritis. He considers that a further study of the lesions of the cerebro-spinal axis following acute meningitis will explain the close connection between the epidemics of acute spinal paralysis in children and adults and the epidemics of cerebro-spinal meningitis. A paralysis of meningeal origin can be differentiated from that of anterior poliomyelitis by the meningeal symptoms, viz. lymphocytosis or presence of ploymorphonuclear cells in the cerebro-spinal fluid, severe pain in the limbs, the slower recovery from the paralysis, and the absence of atrophy in the muscles involved.

Acute Anterior Poliomyelitis.—(*Intercol. Med. Jour. of Austral.*, April 20, 1909). (*Brit. Jour. Chil. Dis*).—Green gives details of two fatal cases of this disease during an epidemic at Bendigo. In a boy, aged five years, the disease commenced with symptoms of intense meningitis; after the fall of temperature there was gradual extension of paralysis involving the intercostal muscles. In a baby aged six months there occurred in the seventh day dulness of the right lung with tubular sounds of the upper third, indicating either an invasion by the same organism or a secondary infection. Death occurred on the day following the lung infection. In this case there was a gradual extension of the paralysis after the disease appeared to be at an end.

Bacteriological Examination of the Cerebro-Spinal Fluid—Four specimens of the cerebro-spinal fluid were obtained from this case. When withdrawn the fluid looked quite clear, but, after standing a little while, grayish sediment collected which, on microscopical examination, proved to consist of lymphocytes. After centrifugalizing the fluid, a further examination showed that these deposits consisted entirely of mononclear cells, and that there were no polymorphonuclear leucocytes to be seen, and, in this respect, the writers point out that their results resemble those obtained by Geirsvold in 12 cases taken from an epidemic of acute poliomyelitis which occurred in Norway in 1905.

In most of the cover-glass preparations, made from the two earlier specimens of fluid, a few widely scattered diplococci could be distinguished. In a few instances two pairs were grouped as tetrads. There was some indication of a capsule, but this was not so distinct as it was with the diplococci which were found in the cerebro-spinal fluid of rabbits.

The diplococci were always found free in the fluid; no intracellular forms occurred. No culture of this diplococcus on artificial media could be obtained; media of every description were inoculated with the fluid, and incubated both aerobically and anaerobically, but in no instance was growth of any kind obtained.

Rabbits were inoculated intracranially with the fluid and, in three instances, the diplococcus was found in the cerebro-spinal fluid on the 22nd, 50th, and 53rd days after injection and, in two of these instances, the rabbits became partially paralyzed on the 52nd and 49th days after inoculation. Unfortunately no complete histological examination of the cords of these paralyzed rabbits was made.

In summing up the evidence concerning the infective nature of acute poliomyelitis, these authors consider that Geirsvold's investigations show that a specific disease exists of which acute poliomyelitis is a frequent and prominent, though not essential, feature, and they consider that the instance they have recorded represents a sporadic case of the disease of which Geirvold observed an epidemic.

They do not, however, consider that there is sufficient evidence to assume that acute poliomyelitis is always the result of a particular diplococcus infection, but rather lean to the view that the symptoms may be produced by toxins of various natures, and, in support of this, they quote Trevelyan's observations on cases which followed immediately on such different infections as those of measles, typhoid fever, and acute rheumatic fever.

Acute Polio-Encephalitis.—Reginald Miller, M. D., M. R. C. P., writing on this subject in *The Practitioner*, states: As in acute poliomyelitis, so in polio-encephalitis, the disease may make its appearance in two ways, either with or without such constitutional symptoms as sore throat, headache, fever, drowsiness, delirium or convulsions. It is more common for some constitutional disturbance to precede or accompany the symptoms dependent upon the destruction of nerve tissue than for it to be entirely absent. As is to be expected, such severe symptoms as unconsciousness and convulsions are more frequently present in encephalitis than in the spinal form of the disease until the local symptoms develop there is nothing in the illness to suggest the character of the infection, and the patient may be thought to be suffering from influenza or from one of the common fevers of childhood.

In which ever way the disease develops the symptoms due to destruction of gray matter, appear suddenly and are complete, if not at once, at all events within a very few hours.

Classifications and Symptoms. Cases of acute polio-encephalitis can be classified into various groups according to the localization of the chief lesion in the brain- It is, however, to be remembered that just as the brain and cord may be both involved, so more than one part of the brain may be affected with sufficient severity to produce symtoms.

The chief varieties of this disease may now be described.

I. Polio-encephalitis Superior. Under this term is now usually described encephalitis of the cerebral cortex. Three groups of cases are known, according as the Rolandic, frontal, or occipital areas are affected. Of these the motor cortex is most commonly the seat of the disease, and it was in such cases of cerebral hemiplegia that Strumpell first, in 1884, sugested the analogy between acute poliomyelitis and ceberal cases, so that they are sometimes termed Strumpell's paralysis. They are then one of the forms of acquired infantile hemiplegia. Such cases have been confirmed pathologically, as, for instance, in a case of Dr. Batten's. Encephalitis of the frontal and occipital areas of the brain have also been recorded, ssociated with mental and moral deterioration in the one and with blindness, normal eye-grounds and active pupils in the other.

II. Polio-encephalitis Inferior. In this the nuclei of the cranial nerves are affected, and this is the form most commonly seen associated with widespread lesions in the spinal cord. The nuclei of the nerves supplying the muscles of the eyes, the facial and auditory nuclei and those in the bulb may be attacked, the last forming the condition described as "poliomyelitis bulbi," to be described later. Pathological evidence has been found in some of these various conditions.

III. Acute Ataxia (*Encephalitis Cerebelli*). This important group was first described by Leyden in 1891, and a number of cases have been reported by Dr. Batten. Instances of this form of the disease are not uncommon, and give rise to considerable difficulty in diagnosis to one unfamiliar with the condition. The prominent symptom is that of ataxia, which develops suddenly, usually with some general constitutional symptoms. It is to be remembered that while the child is in a drowsy state the ataxy will not be obvious and that it becomes appreciable when the patient begins to get better and attemps to do things for himself. The ataxic character of the movements is usually very well marked, and often is extreme. It may be associated with hypotonus of the limbs, nystagmus, and scanning speech; these, however, are not necessarily present. The reflexes may be unaltered in a simple case, but frequently, owing to more extensive lesions, there are extensor or variable plantar responses.

As this disease is rarely fatal, in only a few instances has the clinical diagnosis been confirmed pathologically. One such case, examined shortly after the onset of the disease, was reported in Germany in 1895. What was probably a case of this kind was described pathologically by Clapton in 1871, the acute attack having occurred 30 years previously.

IV. Acute Tremor. (*Encephalitis of the Mid-Brain and its Connections*). This group differs from the foregoing in that tremor and hypertonus are present in place of ataxia and hypotonus. Using the term tremor as descriptive of a phenomenon "due to the alternate action of groups of muscles and their antagonists," Dr. Gordon Holmes has brought forward proof that such a condition is to be associated with a destructive lesion in the red nucleus or its connections with the cerebellum and spinal cord.

The red nucleus and its connections form a system known as the cerebello-rubro-spinal system, which consists of two parts. The cerebello-rubral portion connects the dentate body of one lateral lobe of the cerebellum to the red nucleus of the opposite side by means of the superior cerebellar peduncle, while the rubro-spinal portion (Monakow's bundle) connects the red nucleus with the opposite side of the spinal cord, probably terminating by synapsing round the anterior horn cells. In this system there are, then, two decussations, and both occur in the immediate neighborhood of the red nucleus. It is held that a destructive lesion in any part of the system (dentate body, superior cerebellar peduncle, red nucleus or Munakow's bundle) will produce tremor. Should the lesion be in or close to the red nucleus, the tremor will be on the opposite side of the body, while if any other part of the system be affected the tremor will be homolateral.

Clinically, the two chief symptoms in this group of encephalitis are tremor and hypertonus. The former is a slow rhythmic movememt of a rate of about five a second. When severe the tremor is continuously present except during sleep, and is made worse by voluntary movement or excitement. If universal it gives the child the appearance of shivering from cold. When of less severity the tremor is only brought out when an attempt is made to make use of the affected limbs. It is, therefore, of the "intention" type. The hypertonus makes the movements of the limbs slow, stiff, and awkward, although there is no true spasticity present. As Dr. Holmes has pointed out, these two symptoms, tremor and hypertonus, are exactly similar to the two prominent symptoms of paralysis agitans.

In addition excessive emotionalism may be noticeable, the child laughing and crying in an hysterical manner, while some of the cranial nerve nuclei in the neighborhood of the chief lesion may also be affected.

None of these cases of acute tremor have as yet been examined pathologically.

V. Thalamic Encephalitis. In some cases of hemiplegia due to encephalitis, choreiform or athetotic movements have been observed in the affected limbs. Following again Dr. Holmes's localization, these may be regarded as due to lesions in the optic thalamus.

VI. Pontine Cases are merely a sub-group in polio-encephalitis inferior. In some, tremor may occur from involvement of Monakow's tracts as they run through the pons.

VII. Poliomyelitis Bulbi. This again forms a sub-division of polio-encephalitis inferior. Such cases have been reported and confirmed pathologically. In them there is the sudden onset of bulbar paralysis. Death is not unlikely to occur from implication of the vital centres in the medulla.

VIII. The last group is hypothetical; it has neither been confirmed nor negatived by pathological examination. There are cases in which, after a few hours of slight illness, death occurs suddenly, usually with the signs of acute asphyxia. It has been noticed that such cases are most commonly seen in institutions, and that they tend to occur in small epidemics. Dr. Charles MacAlister has written about them, and an official Blue-Book on "Rapidly Fatal Institutional Diseases" was published some years ago. It has been suggested that some of these cases are due to a poli-encephalomyelitis in which the vital centres in the medulla are the first to be attacked, or at all events the first to give rise to symptoms.

Symptomatology of Acute Anterior Poliomyelitis.—Foerster, O.: (*Berlin. Klin. Woch.*, December 6, 1909, p. 2,180, *Archiv Pediatrics*).

In the author's cases the meningeal symptoms were well marked, not only at the onset of the disease, but also during the whole course, and in a few cases even after the symptoms of paralysis had disappeared. Among these symptoms were pain and ridigity of the neck, hyperextension of head, especially when the attempt was made to lift the upper part of the body by means of the arms. Pain in the back was likewise complained of, especially on passive motion. All the painful muscles were also tender. The Kernig sign was present in a few cases. The condition so closely simulated cerebro-spinal meningitis that in some cases lumbar puncture was resorted to as a diagnostic aid. The cerebro-spinal fluid was clear under considerable pressure and contained an increased number of lymphocytes. The knee-jerk was not always absent. Ankle clonus was often present at the beginning of the attack and sometimes after the paralysis had disappeared. The Babinski sign was observed at one time or another in all of the cases.

The author saw not a few cases with protracted evolution, *i. e.*, where the height of paralysis was not reached before the tenth or twelfth day. Relapses with renewed fever and fresh paralysis were not rare.

The author calls attention to a few characteristics of the paralysis. The foot is often spared, when all other parts of the lower extremities are involved. Even when a part of the foot is involved, the toes always remain free from paralysis. The same conditions are seen in the upper extremities.

An interesting series of cases is that of paralysis of the muscles of the abdominal wall. The author saw four cases in which the paralysis began in this part of the body. The symptoms were dome-shaped abdomen, with bulging during crying or coughing. These patients could not get up from the reclining posture without aid. Marked constipation, not much influenced by laxatives, was usually associated with this condition.

Serum Therapy of Epidemic Cerebro-spinal Meningitis.—Simon Flexner (*Jour. Amer. Med. Assn., Amer. Jour. of Obstetrics*,) is still extremely conservative in his estimate of the value of his anti-meningitis serum. He calls attention to the fact that in most of the countries in which it has been employed with such apparently favorable results the epidemic was at its height or already on the wane; but, fortunately, in France it was just beginning. Reports covering 100 cases or more in that country show a mortality which will probably be less than 25 per cent. while a smaller number treated by other methods have given a mortality approaching 80 per cent. The writer presents a tabulation of 712 cases in which the bacteriologic diagnosis was made and the serum treatment used. It shows that the highest mortality occurred in the first two years of life. But, contrary to the rule under the older forms of treatment in which the mortality was 90 per cent. or over, in this series it was 42.3 per cent. The second age period is from two to five years, in which the mortality was 26.7 per cent. The third age period embraces children from five to ten years of age and gave the lowest mortality of all, namely, 15.9 per cent. The next period extends from ten to fifteen years and gave a mortality of 27.7 per cent. The next period of from fifteen to twenty years showed a considerable rise in mortality, equaling 32.7 per cent., and the last period, embracing the cases of twenty years and over, gave a mortality of 39.4 per cent. The average mortality in all the age periods was 31.4 per cent. The importance of early injection of the serum is shown by another table. The rule of the effects of early injection is preserved in the age periods up to the period of from fifteen to twenty years, when it disappears. The discrepancy occurring in the two highest age periods cannot be wholly accounted for at present. The percentage mortality in the first-to-third-day period was 25.3; in the fourth-to-seventh-day period, 27.8; and the period later than the seventh day, 42.1.

Treatment of Infantile Paralysis—(*La Clin. Infant.*, April 1, No. 7, p. 222).—Dr. Laquerriere lays down the following: (1) At the onset during the febrile stage one remedy alone is of service—hydrotheraphy practised under the form either of tepid baths or refrigeration of the vetrebral column by a bag applied to it. (2) In the succeeding weeks after the cessation of the fever, when the paralysis, at first general, becomes spontaneously localized to certain muscles, all fatigue and worry must be avoided so as to allow the medullary cells, which are simply inhibited, to recover their function, and so as not to over-work muscles which will recover by themselves. At this stage hydrotherapy in the form of warm or tepid baths, especially salt ones, and electricity by means of the constant current applied gradually, possess at the same time a tonic and sedative action which demands their employment to the exclusion of any other procedure. (3) In the stage of slow retrogression there is no fear of lighting up the medullary process, as the lesions are established and circumscribed. The general health must be attended to; sea or mountain air, warm salt baths, sea baths, sun baths, are the most powerful means of toning the organism. The nutrition of the affected limbs must be acted on by massage, passive movements, douches, the constant current, one pole on the limb and the other on the vertebral column. Articular deformities must be attended to by manual treatment, mechanico-therapy, and careful watching for faulty attitudes. Motility must be encouraged by electricity, gymnastics being rarely available for the wasted and weak muscles. (4) In the last stage, that is, three or four years after the onset, the muscles which have completely or partially recovered should be re-educated by simple or electrical means. Deformed articulations must be subjected to mechanico-therapy by orthopedic apparatus or surgical means. Muscles still affected must be still subjected to electrical treatment or transplantation of tendons. (5) This treatment should be commenced as soon as possible; infants thus treated in the first weeks escape the worse consequences of the disease. But even a late commencement may be followed by considerable success.

BOOK REVIEW

Functional Nervous Disorders in Childhood. By Leonard G. Gutherie, M. A., M. D., F. R. C. P., Senior Physician to Paddington Green Children's Hospital. Physician to the Hospital for Epilepsy and Palsies, Maida Vale. Second edition, cloth 8 vo. 300 pages. Postpaid, $3.00. Oxford University Press, 35 W. 32nd Street, New York City.

The object of this work, in brief is to emphasize the truism that the nuerotic child is the father of the neurasthenic adult. The contents of this volume consist chiefly of lectures and addresses delivered at various times before provincial branches of the British Medical Association, and the Post Graduate College in London.

In this revision, many parts have been rewritten and rearranged and much new matter added. Fears of neurotic children, disorders of sleep, moral failings, mental and educational over-strain, day terrors and night terrors, chorea, tics and defects of speech are some of the subjects covered in this handy little volume. The descriptions of these and other diseases are clear, directions as to treatment, definite and disputed matters and theories are omitted.

The closing chapters very satisfactorily describes Idioglossia, which is in brief a defective condition of speech, so peculiar as to give the impression that the child uses a language peculiarly its own. This chapter contains the clearest description of this condition given in any work of recent date. To be clear, brief and yet thorough, and at the same time authorative are points of merit which will insure popularity for this work with physicians and pediatrists.

Diseases of the Eye. By George de Schweinitz, M. D., Professor of Ophthalmology in the University of Pennsylvania. Sixth revised edition. Octavo of 945 pages, 351 text illustrations, and 7 lithographic plates. Philadelphia and London, W. B. Saunders Company, 1910. Cloth $5.00 net; Half Morocco, $6.50 net.

The first edition of this work appeared in 1892 and each successive edition mirrored the progress in ophthalmology, thereby keeping the work thoroughly abreast with modern advances right up to the minute. The very large sale of previous editions of this most excellent work attest the appreciation on the part of the profession for a work on "Modern Ophthalmology". The continual demand for this popular work has made it necessary for the sixth edition to be placed upon the market.

In this revision many parts have been entirely re-written among others, sections of the chapters on Cataract, Diseases of the Retina, and Glaucoma; Iritis and its manifestations; the pathogenesis of Sympathetic Ophthalmia; Intra-ocular Optic Nerve Inflammation (Optic Neuritis) Edema (Chocked Disk, Papilledema); Nystagmus; Pulsating Exophtholmos; the Operation for Ptosis and Orbital Operations.

In addition to the revisions above mentioned much matter has been incorporated. Special paragraphs appear for the first time, on the following subjects: The use of the Astigmatic Lens, or Crossed Cylinder; Obstetric

Injuries of the Cornea; Posterior Scleritis; Cyanosis of the Retina; Atoxyl Amblyopia; Ovular Complications of Nasal Accessory Sinus Disease; Intermittent Exophthalmos; Kuhnt-Szymanowski Operations for Extropion; Galvanopuncture for Ectropion and Entropion (Ziegler); Establishment of a Filtering Cicatrix (Herbert's Operation); Combined Iridectomy and Solerectomy (Lagrange's Operation); Precorneal Iridotomy (Axenfeld); V-shaped Iridotomy (Ziegler's Operation); Smith's Operation for Removal of Cataract in the Capsule; Operations for Prosthesis in Cicatricial Orbit.

The methods of examination, the symptoms, diagnosis and treatment of ocular diseases have received considerable attention. The subject matter is given in greater detail than is usually found in this size book. We considethis volume a very valuable Text Book and one that will meet the requirerments not only of the specialist but the general practitioner as well. It is concisely written, clear and practical, and one we do not hesitate to commend to students and specialists as a reliable text book, written with an evident knowledge of the wants of those entering upon the study of this special branch of medical science.

PEDIATRICS

Vol. XXII SEPTEMBER, 1910 No. 9

EDITORIAL

THE ATTITUDE OF THE PROFESSION TO NEUROPATHIC CHILDREN.

In spite of the profession's advice to the contrary, people of neurotic stock continue to marry and bear children. It then becomes the duty of the physician to watch for the symptoms of the inherited predisposition and to give such advice as will tend to ward off an outbreak of the previous appearance of some mental disease. The main points in the treatment of neuropathic children are as follows:

(*a*) Such children should not be nursed by a neutoric mother, but by a woman sound in mind and body.

(*b*) The teething period should be carefully watched to minimize the chances of brain congestion and convulsions.

(*c*) The body ought to be developed by careful hygiene, regular nutritious diet, suitable clothing, regular sleep, and proper physical exercises.

(*d*) All nerve-stimulants, *e. g.*, tea and coffee, should be interdicted.

(*e*) The body should be hardened by cold baths, gymnastics, and a hard bed. The tendency so characteristic of the neurotic temperament to shrink from mental pain or unpleasantness should be combated by every possible means.

(*f*) The moral training should be directed to the repression of egotistic impulses, to the enrichment of the ideas and their logical connections, and to the training of the will by acts of obedience, self-control, and industry; memory, attention, and powers to analysis, especially demand culture. In a word, the whole personality, which in the neuropathic is, so to say, anemic and poverty-stricken, requires expansion and development. Petty vanities, caprices, and pretensions to importance should be ignored or denied.

(*g*) The periods of puberty, and menstruation are to be closely watched, and these dangers guarded against. Physical or mental overstrain, undue preoccupation with bodily sensations must be carefully guarded against. Should such appear, all school-work should be given up, and rest with physical exercise and quiet country life should be prescribed.

(*h*) The neurotic child may be backward or precocious. If backward, he requires special teaching at the hands of a patient and kind instructor, who will develop the latent capacity; if precocious, he must not be unduly pressed in the competition for school prizes, but must rather be checked and his bodily powers developed, else precocity may end in premature dementia.

(*i*) Neurotic children at an early age are most prone to indulge in self-abuse. Boarding-schools are especially the places where one boy learns the habit from another. The family physician, or father, or both should warn the boy against the practice. If he has already yielded to the temptation, then the best remedies are moral suasion, hard exercise, plain food, and cold baths, with absolute interdiction of all erotic literature.

TYPES OF NERVOUS DISEASE IN CHILDREN.

An endogenous or inborn affection is one which is dependent on inherited weakness, deficient resisting power or faulty development of the nerve cells or nerve tract. Gowers speaks of this as abiotrophy. The nervous tissues wear out unduly early. There is a physiological premature senescence, slow and insidious in onset, inevitable and progressive in course and without retrocession. The child is doomed from the moment of conception. These diseases are independent of external influences, and are possibly dependent on consanguinity, alcoholism or various toxemias in the parents. They are racial and familial, occasionally sporadic. They are not always identical in different families and show family modifications of type. The changes are atrophic or aplasic, without inflammation. Higher cells atrophy and lower tissues hypertrophy. The degeneration is localized in one system. Progressive bulbar palsy, primary cerebro-spinal sclerosis, amaurotic family idiocy, Friedreich's ataxia and muscular dystrophies are the main members of this group.

The exogenous diseases are those dependent on congenital syphilis, and possibly tuberculosis, and on post-natal causes, such as microbial infections, by the action of toxins or mechanical interference with circulation or nutrition. The organism may be present in the affected part as in meningitis; present in other parts as in diphtheria and tetanus, or undiscoverable as in infantile palsy. In certain conditions no morbid change or organism is found, *e. g.*—tetany, insanity, hysteria. Poisons such as lead and alcohol are also causes. It is difficult to bring the effects of traumatism and circulatory affections, the results of embolism, thrombosis or hemorrhage, into this classification, except in so far as they are exogenous in origin.

CARE OF THE MOUTH.

Perhaps no part of the body is so often neglected as the mouth, especially is this noticeable in the case of children. A mother, who will religiously bathe her child and keep its body sweet and clean, will often fail to clean its mouth. A new-born infant should have its mouth washed after each feeding; a soft cloth wet in a weak solution of boracic acid should be used for this purpose. If this were always done we should rarely find a case of infantile sore mouth.

After the teeth come and the mouth is large enough, a small, soft brush should be used; the teeth and mouth should be thoroughly cleansed at least twice daily.

In illness, where sordes and mucus accumulate rapidly, and where the tongue is parched and stiff, attention is needed every hour; the mouth should be kept moist, and the same treatment carried out through the night as through the day. Boracic solution, listerine, lemon juice, glycerine, and distilled water are all refreshing and soften the tissues; where the lips are chapped or fissures appear, a lubricant of cold cream or sterilized vaseline should be applied. Where the gums are spongy or soft and bleed rapidly a few drops of tincture of myrrh added to pure water will help to harden them. Small squares of old linen or soft gauze should be used instead of a brush where one is ill or weak. These should be immediately burned after use.

Every part of the mouth should be cleansed; behind the wisdom teeth, the roof of the mouth, and under the tongue; lemon juice will remove the fur from a thickly coated tongue. Where the teeth are sensitive, the water used should be slightly warm.

THE NEW SPECIFIC FOR SYPHILIS No. 606.

The announcement of Ehrlich's discovery of an absolute positive-instantaneous cure for syphilis is of sufficient moment to be mentioned editorially in Pediatrics. See original article in this issue, from the pen of Dr. Louis Fischer who has just returned from Berlin. Eherlich's discovery was not an accident, but the result of a long series of painstaking experiments and chemical operations—the last of which numbered 606. Hence the name 606, and also the Hata preparation—called in honor of his faithful assistant Hata. The preparation 606 is an arsenical product dioxydiamidoarsenobenzol—a light yellow powder which is applied in a 0.5 per cent. to two per cent. solution. Dr. Wechselmann experimenting with this remedy at the Virchow Hospital in Berlin has observed that the spirochete begin to disappear from chancres and condylomata in a few hours after administration. He says: "that the most skeptical will admit that the new remedy acts on the symptoms of syphilis in all their infectious forms, with a rapidity and thoroughness which cannot be approached by any other known remedy." He has carefully and thoroughly tested it in a series of 80 cases and states that the action occurred with a positiveness that was pleasing. At his hands syphilitic eruptions and ulcerations healed very rapidly; in cases of indurated chancres the surface cleaned up and rapidly healed. Neisser says that "it can be affirmed with certainty that the new remedy exerts a remarkable, even surprising action on the spirochete, as well as on the syphilitic products themselves." A number of other investigators have reported favorable results. The character of the men making these reports concerning this new remedy is of such nature as to convince the profession that a wonderful remedy has been discovered, and while danger, as yet unknown may be found to result from its use, we are bound to admit that it appears to be a remedy full of promise. The remedy is not yet on the market. Ehrlich stated that he would not give the remedy into the hands of private practitioners until 3,000 cases were reported on.

CHILD LABOR PROTECTED IN MASSACHUSETTS.

The State of Massachusetts has wisely enacted a statute for the better protection of children forced by economic necessity to labor in stores, factories or workshops. Before being permitted to enter the employment of such places these young people must submit to a medical examination to determine whether they are physically and mentally able to be employed as wage earners. This progressive law applies to children between the ages of fourteen and sixteen, the pubescent period when care is especially required. While we all know and must admit that it would be far better to prohibit children of this age from laboring at this period of their lives, especially girls for their own sake and for their future for it is at this period that a girl changes from a girl to a woman—when she should be allowed to develop physically and mentally to ensure a physically better woman—to be the mother of perfect children—at least a better generation upon the whole than now obtains, we must accept present industrial conditions, which relentlessly force the young growing bodies of boys and girls to drudge and delve for the sake of subsistence or to maintain worthless drunken fathers. Massachusetts is progressive in enacting this paternal law in the direction of ameliorating the lot of the young until such time when public opinion will lay a hand upon the industries of the country and say you shall not employ children until, after the pubescent period, and keep the child in school either technical or otherwise, until this period of their existence is passed.

A NEW FEATURE IN THE PREPARATION OF ABSTRACTS.

Beginning with the October issue there will be inaugurated a new feature in the preparation of abstracts of "Current Pediatric Literature." The abstracting will be under the charge of a corp of associate editors, each of whom will have a special department. After many conferences with our council and collaborators we have selected the Associate or Department Editors with great care, looking into the special qualification, experience and peculiar fitness of the individual to assume charge of a special department. We are satisfied that we have selected well and wisely, and can promise our subscribers that we will now serve up to them, condensed, the latest of the world's best and most advanced teaching in Diseases of Children.

Pleasing Felicitations.

Since the appearance of our special *Poliomyelitis* number (August) issue we have been overwhelmed at the mass of congratulatory letters and telegrams received from the leading Pediatrists and from prominent Neurologists from the four corners of the great broad land, as well as from foreign countries. These letters contain more than mere congratulatory complasiance,—they have in them the true ring of genuine, hearty, appreciative fraternalism and support. The demands for this special number have been so great that we realize this special edition should have been twice the size. To say that we appreciate these assurances is only to speak in guarded terms, for we are more than grateful for the felicitations conveyed.

A Labor of Love.

The appearance of this issue ends the first year of the present management of Pediatrics. It has been a year of hard work, many changes have been made, a few of our subscribers have taken exceptions at our policies, but on the whole we have gained a score of friends where we have made an emeny. This year's work has been "a labor of love." The editor has expended much gray matter and more dollars trying to make Pediatrics worthy of the patronage and support of the leading Pediatrists of this and other English speaking countries. We are satisfied to leave the verdict to our subscribers. It is for them to pass sentence—as to whether we have wrought in vain or otherwise. The pleasing, congratulatory letters received convince us that we have "made good" and that our efforts are appreciated.

PEDIATRICS

ORIGINAL ARTICLES

ARE THE TEETH OF CHILDREN INJURED BY THE LOCAL EFFECTS OF EATING SWEETS?*

BY

SAMUEL A. VISANSKA, Ph. G., M. D.
Physician in Charge, Children's Dispensary Womans' Board of City Missions;
Visiting Physician to the Home for Incurables, Etc., Atlanta, Georgia.

I am especially pleased at this opportunity to meet you gentlemen of the Georgia State Dental Society, not only because the occasion promises to be helpful to me, personally, but also because it seems to me to be highly significant of the growing tendency toward mutual co-operation between the two branches of the same profession, each one of which though individually diverse in methods and means, yet are still closely allied and united in the mutual effort to promote as far as possible the well-being of our fellow men and to contribute towards as much physical perfection as may be permitted to the race.

I know that our modern civilization is often blamed for many of our modern physical shortcomings, and we are all familiar with the trite phrases which declare that modern man is largely responsible for his own defects; that the savage was free from our latter day ills; that man in a primordial state was endowed with perfection of body in every detail, and a myriad like petty fancies which have but small foundation in fact. In the single instance of the teeth alone, we have absolute proof that the savage suffered every ill which modern man knows in a dental way, as proven by the skulls with the imperfect teeth which have been found, and no doubt other ills existed also, but they cannot be so easily proven, for the teeth remain as indestructable as the other bones of the body while the flesh passes away. Yet what is true of one is doubtless equally true of the other thus showing the close relation between the teeth and other parts of the body.

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*Read before the Georgia State Dental Assocation.

I have always believed, too, that the physician could, in a great measure, facilitate the work of the dental surgeon, and this is more particularly true when the individual physician is, like myself, chiefly concerned with the diseases of children. Naturally and necessarily from the very nature of things, many things first appeal strongly to such a physician as he has access to the young child before it is even possible for a dentist to reach the patient, and often, too, the first physician called to the service of the child subserves the double purpose of educator to the parent as well, and this education should include due caution in regard to the child's first teeth, to which if care is properly given the child owes much of its early health. Nature, Herself, points to the close relation between the infant and its teeth, because in the sixth week of foetal life the teeth formation begins and the health of the mother contributes largely to the perfection of the bone formation of the teeth as well as to the other boney structures of the child's body. Hence, according to the best authorities care should be given to selecting such foods for the young child as well as for the prospective mother as will supply a sufficient amount of bone salts so as to insure a healthy bone formation. In this connection I would say that I believe if we would guarantee for our children a satisfactory set of teeth, that we should, first of all adopt Dr. Oliver Wendall Holmes' receipt for longevity and advertise before the child is born, not so much for "long-lived parents" as for parents and ancestors with good teeth! I know from personal observation, as well as from the observation and experiences of others, that good teeth and bad teeth, like bald heads, run in some families. I know, too, that beauty of teeth, both as to shape and coloring is very often inherited, and I know that this, is, truer of the teeth than of any other one feature. Possibly because the teeth are so closely allied to the very foundation of the child's being, as it were, may be a one reason for the strong heriditary influence discernible in them, for, unfortunately the teeth very often form an illustration of the old Biblical edict that the "sins of the father shall be visited on the children."

Within my own personal experience there has recently come an instance where I examined a young child whose teeth were in a most lamentable condition. After questioning the mother closely I could find no reason for this either in her own condition or in the care she had given the little one. As far as it was possible to discover, sanitary rules had been carefully observed and I was at a loss to account for the really terrible condition evident in the child's teeth. A little later I discovered, purely by accident, that the father had been, at one time, and most probably before and at the time of the child's birth, treated for blood troubles of the gravest nature. I do not doubt that while he was iodized, mercurilized and "boiled out" at the springs, still the disease with which his system was impregnated had left their baleful influence on the little life which owed its existence to him.

And this brings me directly to the subject which has given me much food for thought and upon which I have not yet come to any definite conclusion. This subject, or rather problem, is whether the eating of sweets in childhood does or does not have a direct local effect upon the teeth. That there should be such an effect does not appeal to my reason. When we consider that the enamel of the teeth is the hardest structure in the body and that this enamel is only two per cent. water and that it effectually protects the softer dentine which forms the next layer in the tooth construction, and that this dentine in turn surrounds the nerve centers, it certainly seems difficult to believe that any substance which remains only a short time in the mouth could penetrate these protecting surfaces and succeed in attacking the vital portion of the teeth; especially if such a substance is not, in itself of a deadly corrosive or destructive nature. Yet, from time immemorial it has been handed down to us as an axiomatic decree that the eating of candy or other sweets does have a direct effect on the teeth causing rapid decay and thereby preventing the proper grinding of food and eventually causing stomach or intestinal troubles with all the myriad dangers attendant on malnutrition.

While we have been able to disprove many of the old accepted ideas, such as the cherished fallacy of teething causing summer complaint in infants and thus increasing the death rate at an alarming ratio, because of this so-called "natural" cause, yet it is more difficult to demonstrate the fallacy of other theories where conditions are less clearly defined.

I have considered carefully what candy eating really does for the teeth, and apart from the hard stick candy which might injure the cutting surfaces of the teeth, or the tough chewing candy which might have a similar effect by dulling the surfaces exposed to it, it does not seem probable to me that further injury could be done to the hard enamel by actual contact with sweets. We have been told, however, that often the solution of sugar or glucose of which the average candy is made, causes a process of fermentation which results in lactic acid and that this acid does attack the enamel and acts directly upon it thus causing decay by injuring this hard surface and hence exposing the dentine, which is, in turn, similarly attacked until at last the vital structure of the tooth is reached.

But now let us see what actually happens when glucose or sugar does ferment in the mouth. If the sugar or glucose is held in the mouth long enough at the normal temperature of the mouth which is 98.6 degrees this fermentation will produce $C\ O_2$ and alcohol, and later acetic acid. Now alcohol is really a perservative and therefore $C\ O_2$ must be the dangerous element. But can this be true? As a matter of fact there is absolutely no evidence in support of the destructive quality of carbon-dioxide and even if this apparently harmless gas could effect the teeth there is still another reason why its dangers are minimized. We all know that after eating sweets we get very thirsty and usually take water immediately, thus diluting the sugar which may remain in the mouth. The reason for this thirst is that sugar has so great an affinity for water that as soon as it reaches the stomach water is taken up by a process of dialysis through the walls of the stomach and Nature to compensate for this demand and the consequent deficiency of fluid, demands water through the mouth. The result is that the ample washing of the mouth after eating sugar would seem to point to yet another reason against the theory of tooth decay from contact.

It has also been determined by testing with litmus paper that in from one to six hours after eating sweets the influence of this acid, even if it should be harmful, had disappeared for there is no trace of it in the mouth within the period of time mentioned. Asetic acid, however, does not have any effect on the enamel, this I have proven by actual test.

Lactic acid in appreciable quantities will attack the enamel of the teeth causing a jelly-like substance to form thereon. But the lactic acid foods, such as butter-milk as well as many of the present day foods which are prepared from lactone ingredients are too weak in lactic acid to have any direct effect.

The effect of a solution of lactic acid of the proportion of one dram to the ounce, when applied to a tooth I have proven by direct experiment.

While it is undoubtedly true that children's teeth do decay, often even when the utmost parental care is given to them, still I am altogether uncertain as to the real cause of this trouble, for I firmly believe that we have not found the solution of the problem in the one phrase "too much sweets." I would like, however, to learn something in support of this theory for from my own investigation I can only discern the negative side of the question.

Of course I know there are many stomach troubles which might result in acid formation in the mouth which directly injure the teeth and such conditions might possibly result from excess of sweets in the stomach or from other dietetic indiscretions—but that contact in the mouth with even the excessive quantities of sweets which the normal child craves, does not appeal to me as a logical reason for decayed teeth.

I shall be more than glad, however, to have my own doubts dispelled and would be profoundly grateful for a practical working theory as to the real reason for decaying teeth in children. I feel that to be thus fore-warned gives me, personally, and my brethern professionally the very decided advantage of being also fore-armed in our continual warfare against disease in childhood—a warfare the success of which means not only the preservation of the individual but the actual physical advancement of the entire human race as well.

PRELIMINARY NOTES.

A FEW DATA CONCERNING THE NEW EHRLICH-HATA THERAPY CALLED 606.

BY

LOUIS FISCHER, M. D.

Attending Physician to the Willard Parker and Riverside Hospitals of New York; Attending Pediatrist to the Sydenham Hospital; Former Instructor in Diseases of Children, New York Post Graduate School and Hospital.

While in Berlin last month a few interesting Clinical observations were made—Medical Berlin is deeply interested in studying the clinical value of Ehrlich-Hata Therapy in Syphilis.

This preparation is the result of a series of 606 different studies which now seem to have resulted in a specific remedy for the cure of spirocheta infections in syphilis.

It is an arsenical preparation derived and combined as an aromatic derivative—and is scientifically called monochlorate of diaxydiamidoarsenobenzol. It is described in literature by its last name or "Dioxydiamidoarsenobenzol." Ehrlich himself has named it Hata 606 in honor of his faithful assistant named Hata.

The medication is a light colored powder in aseptic ampules of glass and is dissolved in methyl alcohol or glykol to which about 10 ccm. of sterile water is added, then add one-half ccm. of one-tenth normal Na O H solution, add water enough to yield 25 ccm. and this very acid solution is injected. The dose of the preparation used is from 0.1 to 0.6 grammes. It is given in the form of an intragluteal injection—used once only.

The Wasserman reaction is then made to control the result of the treatment, as a rule—a negative reaction resulted within 24–48 hours after treatment. It is for this reason that specific results are claimed for this method of treatment.

Only such cases were injected in which a positive Wasserman reaction was found—and in which distinct evidences of syphilis existed.

Adults were used in whom mercurial treatment has been given with indifferent or no results. Some syphilitic adults of many years standing were also used for clinical studies.

Likewise children in whom distinct luetic manifestations existed were subjected to this form of treatment. In some instances intravenous injections were made and their effect compared with the intragluteal method of infection was inferior.

The specific effect in syphilis was noted on the mucus patches and on all syphilitic exanthematous eruptions papular or otherwise—ulcerous and all glandular swellings showed evidences of healing within a few days after an injection. Chronic recurring ulcerations and eruptions disappeared so soon after an injection as to occasion surprise.

Clinical report of Abt, Schreiber, Wechselmann-Lange Treupel are among the observers on record—so also Von Zeisl recently added to the specific virtues of this remedy.

Great enthusiasm prevailed at the last meeting of the Berlin Medical Society after the announcement of the new antiluetic remedy which seems destined to aid—with one injection in the destruction of the syphilitic infection.

Levi studied the urine following the arsenic injection and notes that arsenic is found at least 12 to 13 days therein local effect of the injection.

A slight erysipelatous redness and infiltration of the deeper structures was found in many cases—not in all. A slight rise of temperature was noted about three days after injection—the fever being about 100-100 three-fifths.

Constitutional Effects.—There was no disturbance of the nervous system—no ill effect on the vascular or gastro-intestinal tract—the heart was not affected, the urine showed no abnormality—no casts, there was no methhaemoglobin in the blood. There was slight leucocytosis (Hirschfeld) in some cases. Even a case of severe nephritis subjected to this treatment did well. A case of pernicious anemia—following a syphilitic infection one and one-half years ago seemed slightly inproved after above treatment.

Some observers looked for the disastrous effects on the optic nerve and Fehr, in a very thorough clinical investigation reported no ill effects from this remedy.

Effect on Heriditary Syphilis of Nurslings.—Cases of pemphigus neonatorum were selected because they are usually fatal. Several cases of infantile syphilis were seen by me, but cannot be reported, as they are still under observation. So much can be said, however, that eruptions disappeared, ulcerations and sloughing of the uvula ceased and a general tendency to renewed vitality appeared, such as has never been noted with mercurial or K. I. treatment. From what has been seen by me it appears that this remedy offers a specific therapy in syphilis which will do away with the old mercurial remedies.

Some changes have been suggested in administering this remedy, as the use of methyl alcohol is not without dangers.

PHYSIOLOGY AND PATHOLOGY OF DIPHTHERETIC PARALYSIS.

Translated from La Clinique Infantile, 1 Nov., 1909, by

FREDERICK S. MASON, M. D.

New York City.

The study of clinical findings and experimental research proves that paralyses of diphtheria were often connected with the situation in which the toxines and endotoxines occurred and that the attack on the nerve centers frequently takes place by an ascending toxic inflammatory process within the nerve sheath which appears to be similiar to the process taking place in tetanus and hydrophobia.

The pathologic anatomy, even with the most recent processes of coloration, has not given us a very precise knowledge of the pathology of these paralyses. It therefore appeared that the physiology and pathology of diphtheretic paralyses deserves original methods of investigation, which are briefly resumed in this preliminary note.

Observations made on a patient of twenty-three years old at the Hospital Cochin, Paris, 20th of August, who entered with a severe diphtheretic throat. He received 40 c. c. serum, which was continued. On the 28th of August he began to have certain difficulty in swallowing; on the 2nd of September he vomited; on the 3rd of September, he was very pale and cyanotic, and appeared to be profoundly intoxicated; was found to have a bilateral paralysis and rejected all liquids by the nasal fosse, followed by paralysis and loss of accommodation on the left; he had hiccoughs and dyspnea; the pulse was small, soft, irregular, arterial tension showed 11 c. c. mercury by Potain's apparatus. He had no fever; urine contained albumen. In spite of a new injection of 20 c. c. of anti-diphtheretic serum and cardiac tonics, the patient had a vomiting in the afternoon of the 4th of September. The hiccoughs increased, pulse fell to 44, and he passed away at ten o'clock in the evening of this day.

At the autopsy, microscopic examination of the central nervous system did not show any special lesion. Histological study of the bulb was not made at the time. It was reserved for later experimentation. The liver had all the signs of intoxication with little ecchymotic spots on the surface. The kidneys were decorticated easily, but showed points of hemorrhagic nephritis. Nothing special was noted in the spleen or suprarenals; the lungs were congested at the base; the cardiac cavities contained a few clots without a true thrombosis.

At the time of the autopsy, we thought that instead of cutting the bulb (in order to show the cellular lesions so often looked for,) it was preferable, to show by biological experiments, the absence of toxic bodies which histochemical methods would not show.

This cephalo-rachidian fluid withdrawn on the 4th of September by lumbar puncture, was limpid without trace of cellular reaction. Injected into guinea pigs in doses of one-half centimeter into the cranium cavity and the peritoneal cavity, it did not produce any disturbance. On the other hand, inoculation of the central nervous system with extracts of the bulb showed evidence of poisons in certain parts of the bulb. This was our method of procedure: The pons and medulla were washed for twenty-four hours in a current of water in order to eliminate any possible action of the toxine contained in the blood.

With a sterilized instrument, we then opened the juxta-ventricular portion of the bulb at the exit of the vagus. This nerve substance was crushed in a sterile mortar, triturated with its volume of physiologic serum and injected into three guinea pigs in the following manner:

Guinea pig No. 1. Received at 4 P. M., one-quarter c. c. of this emulsion by intercranial injection, which operation is inoffensive in itself. The animal died during the night. No. 2 received one-half c. c. emulsion in intraperitoneal injection. Death followed in thirty hours. No. 3 received one-half c. c. of emulsion in the right foot. Death followed in seventy-two hours.

The autopsy of these animals showed no trace of infection in the brain or peritoneum, and blood cultures from the heart remained sterile.

On the contrary, the same injections practiced on control animals in the identical manner with emulsions made from cervical brain matter taken from the anterior pyramids of the bulb, were absolutely negative to the results on the guinea pigs.

These experiments appear to prove that there existed in certain parts of the bulb of the deceased patient, toxic bodies which were not present in other parts of the nervous system, and suggested that diphtheretic toxines, therefore, fixed themselves in certain definite locations in a similiar manner to the tetanic toxines. Small portions of the central nervous system were now washed with water to eliminate all blood contained in the vessels and were put in contact during six hours at .0 C. with pure diphtheretic toxine and diluted to 1-10, 1-100 and 1-200 with physiological serum. They were then submitted to washing with running water during twenty-four hours and crushed in a sterile mortar with an equal volume of physiological serum. The intracranial inoculation of these emulsions brought about the death of six guinea pigs, the dose being from 1-5 to 1-4 c. c. The subcutaneous inoculation gave a positive result in two trials. The intraperitoneal inoculation gave a positive result in five trials; the control animals inoculated in a similar manner by intracranial and intraperitoneal subcutaneous injections with nerve substance which had not been submitted to the diphtheretic toxine, all resisted and were not in any way affected. We think therefore that we have good reason to believe that the nerve substance is capable of fixing the diphtheretic toxine.

In another series of experiments, we looked for those bodies which can best fix the diphtheretic toxine, and were able to show that the lipoids contained in the ethereal extract of brain matter, contain in a high degree the power of fixing this toxine.

Our experience appears to prove, better than has already been done by a pathological anatomy, the central origin of diphtheretic paralyses. Our patient had all the signs of a profound diphtheretic intoxication. This slow and continuous intoxication has allowed us, without a doubt, to realize the maximum of toxic impregnation of cellular groups of the bulb, and especially at the origin of the vagus nerve, so that this case was particularly favorable for the biological experiments we followed out. It is probable that in a great number of diphtheretic paralyses which are rapidly fatal, the toxic bodies are less localized, and therefore difficult to put in evidence. We hope that our work will be confirmed by other workers.

THE VALUE OF EXERCISE IN INFANCY.*

BY

ST. GEORGE T. GRINNAN, M. D.

Lecturer on Diseases of Children, Medical College of Virginia, Richmond, Va.

The Roman physicians gave special regard to the value of exercise. One of the most notable writers on the subject was Celsus whose advice is good today. He advises exercise which should always precede food. So earnest is Celsus in advising exercise, that he says that if the usual means of exercise are not available, such as riding or sailing or the violent exercise of a carriage, a bed ought to be suspended and moved from side to side. If there be not even that, a prop is to be put under one foot and by this fulcrum the bed is to be propelled backwards and forwards by the hand.

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*Read before the Richmond Academy of Medicine and Surgery, July 12, 1910.

In the second century of the Christian Era exercise is much discussed. "And it is better in the open air than in a portico, better in shade formed by shrubberies than that which is under a roof." (Food, Air and Exercise.—Rabigliati, p. 529.) The Roman may not have known about oxidation or waste products in the blood; he may not have been able to give chemical names for these substances, but his juxtaposition of digestion with movements and his clear preception of their interdependence and relations to one another mark him out as possessing the insight required by the accomplished physician at all times. This same man compelled our admiration by his advice regarding the changes in the pulse many hundreds of years before the discovery of the circulation of the blood.

We have a large number of valuable books on the subject of exercise, mostly found on the Swedish system inaugurated by Ling. Baron Nile Posse has published (Lee and Sheppard, Boston) a small but well arranged set of exercises for children. One of the oldest schools in North Carolina has for its motto, "*Mens sana in Corpore sano.*"

In England, beef is made tender by chaining a steer to the stall for six months. The lack of exercise makes the muscles tender. The modern poultry man raises chickens in a box four by eight feet, in order to have tender meat. Compare the digestion of a bank clerk with that of a husky farmer.

Parents are not and should not be content with simply preserving life in an infant. They naturally expect a well-developed, healthy child, because they are beginning to find that there are means to obtain good development even in early infancy. When an infant is able to walk, and is in the second year, exercise becomes a very important factor and a valuable aid to digestion. When an infant is eighteen months old exercise is especially valuable, and an infant of this age, when allowed to play on the grass in the open air, in the shade if hot, will eat and digest what the same infant would neither eat nor digest when heavily clothed, strapped to a go-cart and rolled about on brick pavements in a town. An infant just beginning to walk is delayed in walking if it must depend on brick pavements where a fall will result in some injury, or the mother fears to allow the child to walk lest it be injured by falling. This delay in walking is a serious drawback to digestion. A mother should be taught that while an infant, by means of a go-cart, can be raised in a town, the same infant will do much better if raised in the suburbs or the country where a grass lawn will afford a place for exercise in pure air. I believe that the go-cart, while a valuable means of taking an infant out, has been much abused and has been the cause of much early under-development, with accompanying digestive trouble.

I recently saw, in New York City, an infant eight months old, female, the child of a physician, and under the care of a prominent pediatrician. This infant has been allowed to exercise on the floor on a quilt, and though only eight months old, could sit at the table in a high chair and eat bred. She drank forty ounces of milk a day and ate stewed apples. The infant spent considerable portion of the day in the park.

The following cases will illustrate the value of exercise and country air:

Number 1.—Baby B., was born in the country. When one year old the parents moved to Richmond. The baby was kept in a carriage and rolled about the streets. Digestion was poor, the bowels constipated and gain was slow. When the infant was two years old the parents moved back to the country. The condition improved in every way and the child soon gained weight and strength. After a stay of six months in the country the parents moved back to town. When the child was brought back to town, aged two and one-half years, he weighed thirty-two pounds. The parents remained in town eighteen months, and during that time, the child did not gain a pound. A return to the country brought about an improvement, although this time the improvement was slower, as the child did not care to exercise, was not digesting well and had poor appetite. He remained in the country and soon developed into a strong boy.

Number 2.—Baby W., aged 26 months, lived in a second flat, and was apparently a well-developed child. He was very obstinately constipated, had an obstinate indigestion, and slept poorly. This case was referred to me by a physician who had tried every known means of making the bowels move. Castor oil, salts, cascara, massage, fruits, olive oil and cereals, all seemed useless. High enemas and colonis flushes would, with great difficulty, move the bowels, and the mother and child fought this out every other day. It seemed very hopeless; text books gave little encouragement. I discarded every drug and insisted that the family move to the suburbs, where the child could without danger to himself play under the trees and on the grass the larger portion of the day. The effect was like magic. The child, which had been under constant observation for eight or nine months, immediately had a good appetite and slept well. The good natural sleep restored digestion, and the bowels moved without a purgative. Two years have elapsed since the child moved to the suburbs, and it has remained entirely well.

Number 3.—Baby W., was born in Richmond, and was near dying of milk infection when six months old. The parents moved to the country near the city. The infant is nineteen months old, plays out all day, except for a nap, and eats three meals a day at the table. His diet consists of bread, meat, vegetables including green peas, and anything on the table. Three ordinary mammies would be put in collapse to keep up with him during the day. It would be hard to find a boy in town who can run and play as he does. Surely he would not be able to eat such a diet if he was rolled in a go-cart on a brick pavement in town or tied down to the pace of an old nurse. I am not this child's physician, and do not advocate the diet, but the case illustrates well the value of exercise in pure air.

Number 4.—Baby D. A., mother asked why her child, eighteen months old, did not digest and had no appetite. The child was put in a go-cart at seven A. M. and rolled on the brick pavement for an hour and a half, or sat in the old nurse's lap on some carriage-stone to get the morning air. The child did some little walking, but was held by the old nurse for fear of falling. A carriage drive for the late afternoon was a routine. The bowels were irregular, loose or constipated. Barley gruel half the time was all the child could digest. It had never been to a park for fear of taking some disease. I ordered it to be taken to the park at seven A. M. in a go-cart, taken out and allowed to run about on the grass if not wet, or on the walks.

To the mother's astonishment the child refused to go back in the go-cart the first morning, and walked home, five blocks. The afternoon carriage drive was changed to exercise in a park or a country friend's yard. The effect was wonderful. The child developed a healthy appetite, began eating bread, drank over forty ounces of milk and ate rice. The bowels became firm, yellow and regular, with no medicine since the exercise was prescribed.

Number 5.—A notable instance that came to my attention was that of the female infants, the same age, of two brothers. One brother is well-to-do and lives in Richmond. The other brother is a poor preacher, living in a healthy, elevated, country village. The Richmond baby was nursed nine months, then fed on special cow's milk. She never had any illness, spent the first summer in the country and has done well.

The child of the preacher was born two months after her mother was operated upon for cancer of the breast. This infant was never nursed at the breast and had a hard time for eight or nine months. At the age of eighteen months, this child, with an adverse start in life, was equal in weight and development to the child raised in town with the enviable gospel of good milk. What caused the wonderful development of the infant born of a mother who had cancer, and was not nursed at the breast? This child had a beautiful lawn with grass and shade and pure air. That answers the question. She slept later in the morning, was able to walk early, couldexercise more, and slept in pure air. This child was not kept in the house from nine in the morning until five in the afternoon on account of heat.

Number 6.—A boy, aged seven, was in the hospital with typhoid fever and had an uneventful case. The fever reaches normal in three weeks, remained normal five or six days, at which time it returned and was constant, running to 100 or 101 degrees F. in the afternoon. Otherwise, the child seemed remarkably well. In appearance he was pale. After a consultation, I advised more food and removal from the hospital, where he could be gotten out of bed. This was refused. After another week and another consultation, I insisted that the child be removed from the hospital, as he had a very good place at home. No, the child had fever, and was kept in bed in the hospital on liquid diet. Another week and another consultation,—I gave the same advice, it was followed. Two days after going home where the boy was gotten out of bed, the fever left and recovery was rapid. Of course this is an old story and familiar to all now. In Osler's early articles on typhoid, he says that the only cure for the after-fever of typhoid is to break the thermometer. All know now that the lack of exercise in such cases is sufficient cause of fever.

Number 7.—Baby G., an infant, aged nineteen months, always very strong and healthy, remarkably well developed and in good condition arrived (Richmond) from his country home in West Virginia. At his former home he could walk and play in the yard a large portion of the day, with fresh air day and night. When the family came to town, the child was put in a small room on the second floor. There was no yard, and the porch, in the hot sun, was four feet wide and fifteen feet long. The child could not run in the street, as he was not accustomed to danger. He lost appetite, lost flesh rapidly, became pale like his neighbors and was soon reduced to barley diet with small quantities of milk. His face became pinched and the bones prominent on the forehead. He had little fever. The neighbors consoled the mother with the fact that the child was alive and able to walk. Lack of exercise and pure air were a severe strain on this child's life

Number 7.—Baby S. The parents are poor. The father worked with the best dairy in the city and got plenty of good milk. The mother has twins, which were nursed and then fed on the best milk that could be gotten. The twins are twenty months old, and have never had any serious diarrhea, but have been raised in a small flat and have never had any chance to go out, as the mother cooks and does all of her housework. The skin of each child is soft and flabby. They appear very old. They are so pale and colorless that their complexion is a new standard for whiteness. Good milk, with poor town air and no exercise will not make healthy children.

Pure milk has done more for young infants than any one can estimate, and there seems to be a general notion now that just so the milk is pure the child will live and thrive. Never was there a greater error. We must have green grass, shade trees and pure air together with pure milk. We cannot preach the gospel of pure milk and stop without raising a crop of physically unfit. The absence of literature on this subject is good evidence of how it has been neglected. From the age of two and three years and up, country air or a play ground of ample size is so essential to development of child life, that all who are able should live in the suburbs or in the neighborhood of some play ground. Two months in the summer spent in the country is very good, but twelve months spent in the country is better. One of the most notable instances of the value of exercise in conjunction with fresh air was found when children from orthopedic hospitals in New York City were removed to the seashore. More improvement took place in the hot weather at the seashore than in double the time at the hospital in cold weather.

Such a large number of our population is raised in town, that unless due care is taken, the time must come when the degeneration that has stamped Egypt, Greece, Italy, France and even England, will be talked of in America. There is no truer expression than, "The child is father of the man." By all odds, the largest field of work in the medical world now is pediatrics, where from early infancy we can so develope the body as to eliminate, prevent or minimize the many disorders that flesh is heir to. Where surgical cases are counted by hundreds, children are counted by thousands, and so with adult medical cases. A plea for exercise in pure air is only a plea for sound development.

LACTIC ACID BACTERIA; WHAT THEY ARE AND WHAT THEY ARE SUPPOSED TO DO.*

BY

ARTHUR I. KENDALL, M. D.
Department of Preventive Medicine and Hygiene, Harvard Medical School,
Boston, Massachusetts.

From the earliest historic times, the drinking of sour milk has been practiced by many nomadic and semi-nomadic tribes.

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Originally these peoples undoubtedly consumed milk in the fresh state, unacted upon by bacteria, but the advantages of soured milk must early have been appreciated.

Milk that has soured in a proper manner can be kept for some time without further change and yet retain its palatability, a point of great importance in those countries where no other means of preservation are available. Furthermore, any surplus milk can thus be rendered fit for future consumption, and undoubtedly this purely economic factor has been potent in popularizing this natural method of preservation.

In certain instances, peculiar methods have been gradually evolved to bring about this souring, and the well known Kephir granules may be mentioned as a familiar example. Kephir granules consist essentially of lactic acid-producing bacteria and yeasts enclosed in a coagulum of casein. The lactic acid bacilli ferment the lactose of milk, forming lactic acid, while the yeasts cause a secondary, alcoholic fermentation which gives increased palatability to the finished product.

Kephir granules, and similar ferments, then, are to be regarded as "starters," and our present day use of starters for ripening cream and of dispensing lactic acid bacilli in tabloids is in reality the direct descendant, refined to be sure, of the procedure established centuries ago.

Little interest was manifested clinically in these soured milks until Metchnikoff and his school published their observations on the relation of bacterial putrefaction in the intestinal tract to premature senility, and the employment of lactic acid bacilli to counteract this pernicious activity. About this time, Grigoroff, a student in Massol's laboratory, called attention to the many instances of longevity among the Bulgarian peasants and to the fact that sour milk forms an integral part of their diet. Other observations of a similar nature have been collected, and it is upon evidence of this circumstantial nature, rather than upon well planned and carefully executed conclusive experiments that the whole subject of lactic acid therapy rests at the present time.

It is the purpose of this paper to outline, briefly, the salient features of lactic acid therapy: what the lactic acid bacteria are, the kinds of bacteria employed in intestinal therapy, the conditions under which they may be expected to act in a salutary manner, and the nature of this beneficial action.

Lactic acid therapy consists essentially in administering by mouth living cultures of lactic acid bacilli, either in milk soured by their action; or as tabloids, together with some easily fermentable carbohydrate. The bacteria ferment the carbohydate in the alimentary tract, producing lactic acid.

The object of this treatment is to restrain the activity of certain proteolytic (putrefactive) bacteria in the intestinal tract.

These proteolytic organisms act upon protein, and protein decomposition products, forming aromatic substances, indol, skatol, phenol, cresol, and aromatic oxy-acids, and these aromatic bodies in turn are absorbed, in part at least, and act as slowly cumulative poisons to their host. Such, at least, is the generally accepted hypothesis.

According to Metchinikoff, who elaborated this method of treatment, the putrefactive bacteria are largely anaerobic in character, and are localized in the large intestine.

The lactic acid bacteria, on the other hand, are non-proteolytic in nature, and find their most suitable enviroment in media containing fermentable carbohydrates, which they break down, producing lactic acid in considerable amounts. These organisms do not form putrefactive products, and indeed, under such conditions, they metabolize only enough protein to satisfy their nitrogen requirements.

There are many kinds of bacteria which form lactic acid. but in the restricted sense in which the term lactic acid bacilli is used in intestinal therapeutics, only those organisms are regarded as true lactic acid bacteria which form lactic acid and smaller amounts of the lower fatty acids, but which do not form putrefactive products from protein, and which do not produce gaseous products from the fermentation of carbohydrate.

In addition to the lactic acid bacteria of sour milk, there are normal lactic acid bacilli in the intestines of man and the higher animals. The intestinal lactic acid bacteria are very similar, so far as their nutritive requirements are concerned, to those of sour milk, but there is one rather srtiking difference between the two classes. The sour milk bacteria usually become localized in the small intestines of man and animals, while the intestinal lactic acid bacilli, particularly *B. acidophilus*, which is the best known, find their most suitable habitat in the large intestines. The significance of this difference will be brought out later

To arrive at a clear understanding of the nature of the antagonism between the lactic acid bacteria and the intestinal putrefactive bacilli will necessitate a discussion of the metabolism, chemistry and conditions favoring the respective development of the two types of organisms.

We will consider the proteolytic bacteria first.

There are several conditions favoring the vegetative reproduction of these putrefactive microbes in the alimentary tract:

1. An excess of protein in the diet. Animal protein is far more easily attacked than vegetable protein.

2. Protein in which decomposition has commenced.

3. imperfect gastric digestion or gastric stasis. In these conditions, food is passed into the intestines in a state predisposed to putrefaction.

4. Intestinal stasis; any condition retarding the rate of passage through the lumen of the intestines will tend to increase the activity of putrefactive processes.

5. Impaired intestinal absorption of protein; if the absorption of protein is slow, putrefaction, of a bacterial nature will be increased, since the food supply of these bacteria is increased.

Certain other factors tend to limit bacterial putrefaction in the intestinal tract.

1. Rapid absorption of protein and the products of protein digestion, by reducing the available food supply of intestinal microbes, tends automatically to limit putrefactive processes.

2. Factors causing the rapid passage of food through the alimentary tract as cathartics, and certain forms of spontaneous diarrhea.

3. Starvation; by lessening the food supply of bacteria, inhibits their activities.

4. The activity of lactic acid bacteria in a medium containing fermentable carbohydrate.

5. The presence of carbohydrate alone is not infrequently associated with a diminution of intestinal putrefaction, as shown by the decrease in the amounts of aromatic substances in the urine.

It would appear, then, that there are two distinct types of bacterial activity in the intestinal tract: the first, essentially putrefactive; the second, fermentative.

The putrefactive organisms are essentially proteolytic, and require protein in their dietary. They do not develop in media containing fermentable carbohydrate, in the presence of bacteria capable of forming lactic acid from this sugar.

The fermentative bacteria (lactic acid-producing bacteria) on the contrary thrive best in media containing sugars. They utilize only small amounts of protein, and do not form typical putrefactive products in appreciable amounts. These organisms are distinctly antagonistic in their action upon proteolytic bacteria in saccharine-containing media.

In addition to the proteolytic bacteria, and the fermentative bacilli of the lactic acid type, there is yet a third group of intestinal organisms; a group which as facultative with respect to protein and carbohydrate requirements. That is to say, they can develop well in media containing protein, or in media containing carbohydrate with only small amounts of protein.

This facultative group is by far the largest of the three mentioned, and includes many of the best known and most thoroughly studied of the intestinal flora.

As a familiar example, *B. coli* may be mentioned, and inasmuch as this organism illustrates in a striking manner a fundamental, but by no means generally recognized principal of bacterial adaptation in metabolism, it will be well worth while to consider the products of vital activity of this organism in detail. The facts to be brought out are also of the utmost significance in relation to lactic acid therapy.

It appears to be a fact that the facultative group, of which the colon bacillus is a member, can accommodate their metabolism to different classes of food stuffs in a perfectly definite manner. When they are grown in protein media, their products of vegetative activity are, chemically speaking, typical of protein putrefaction. If, however, they are grown in media containing carbohydrate, the products formed are almost invariably those characteristics of fermentation. In other words, the facultative bacteria combine, under the conditions stated, the attributes of both the proteolytic (putrefactive) and fermentative organisms.

The details of an actual experiment will elucidate this principle most clearly:

Two portions of meat-juice-peptone bouillon were prepared each of exactly the same composition and reaction. To one portion one per cent. of dextrose was added, and the two flasks were then inoculated with the same strain of *B. coli* and incubated a week at body temperature. At the end of that time the contents of the flasks were analyzed chemically.

The flask containing no dextrose, was foul-smelling, alkaline in reaction, and contained ammonia, indol, skatol, phenol and aromatic oxy-acids. In other words this was a typical protein putrefaction.

The contents of the flask containing dextrose were acid, of an appetizing odor, and contained besides carbon dioxide and hydrogen, which were evolved, lactic acid and smaller amounts of acetic and succinic acids.

This decomposition represented a fermentation, although of not the typical lactic acid type, since gaseous products were formed in addition to lactic acid.

The simple addition of dextrose, then, has changed the type of bacterial decomposition from the putrefactive type to the fermentative type.

This protective action of the carbohydrates on the putrefaction of protein is also found to hold in the case of monkeys. The addition of sugars to the diet of such animals, previously on a strict protein regimen, results in the disappearance of aromatic substances from their urine.

The explanation of this phenomenon is not as simple in the intestinal tract as in the test tube, where we are dealing with single organisms, however, and there are two distinct phases to be recognized: first, the presence of fermentable carbohydrate tends to change the character to the metabolism of the facultative bacteria from the proteolytic to the fermentative type. This in itself would eliminate from the urine the amounts of putrefactive products attributable to their activity when the animal was fed on protein.

In addition, however, there is found to be a distinct decrease both in the numbers and vitality of the obligate proteolytic organisms, accompanied by a corresponding increase in the normal intestinal lactic acid bacteria.

The addition of carbohydrate to the diet of animals previously on a strict protein diet, then, tends to diminish intestinal putrefaction, judging from the disappearance of aromatic bodies of putrefactive origin from the urine.

These aromatic bodies are considered by most authorities to be the most available criteria upon which to form a judgment of the amount of protein putrefaction of bacterial origin in the intestinal tract, and they have been so regarded almost universally in lactic acid therapy.

If this be the case, it is perfectly possible to explain the reputed beneficial effects following the introduction of carbohydrate and of artificial cultures of lactic acid bacilli without the intervention of these bacteria at all, since the change in character of the metabolism of the facultative organisms and the suppression of activity of the obligate proteolytic bacteria as outlined above would remove from the urine the substances indicative of putrefaction.

Having thus outlined, in a brief manner the salient facts governing bacterial development in the intestinal tract, it will be possible to consider more closely the specific action of lactic acid as they develop in the intestinal tract.

One of the best known, and widely used sour milk organisms is *baccillus bulgaricus.* These organisms have been shown to localize themselves in the small intestines.

On the other hand, *bacillus acidophilus*, the most thorough-studied intestinal lactic acid bacteria, is found in the large intestine.

If the supposition that proteolytic activity is most marked in the large intestine be true, it follows that *B. acidophilus*, rather than *B. bulgaricus*, would be the more efficient organism to utilize in attempts to control this proteolytic activity, since both these organisms produce considerable amounts of lactic acid in suitabe media.

The lactic acid generated by acidophilus would be liberated in the midst of the putrefactive bacteria, while that elaborated by bulgaricus must be carried with the intestinal contents to the large intestine from the small intestine. Lactic acid is absorbed from the intestinal tract and burned in the body, so it is evident that the amount available in the large intestine would be problematical if the bulgarian ferment were relied upon.

In spite of the accepted idea that the seat of bacterial activity upon protein is localized in the large intestine, the writer believes that there may be a very decided bacterial decomposition of protein in the small intestine as well.

This decomposition certainly takes place in experimental animals under certain conditions, and in the case studied by the writer, this break down of protein was brought about by the symbiosis of an organism of the subtilis group acting with the colon bacillus.

Since the protein acted upon was milk, it may be interesting to outline the process.

A subtiloid bacillus of intestinal origin was allowed to grow in milk; a moderate amount of peptonization of the casein took place. A colon bacillus of similar origin coagulated the casein, and produced a small amount of gas as well

If, however, after the subtiloid bacillus had partially peptonized the milk, the colon bacillus was inoculated, there was a further liquefaction of the casein, and a large volume of gas was liberated.

It is absolutely essential that the bacteria act in the order mentioned to bring about the desired result, and it is a significant fact that this same order of the two types is met with in the alimentary canal.

The symbiotic action of these two organisms, acting in definite sequence therefore, causes a greater liquefaction of the casein and the formation of much more gas than the sum of their separate activities.

This action is prevented by the presence of fermentable sugar and lactic acid bacteria, since this process is largely proteolyitic, and proteolysis cannot take place in the presence of rapidly developing lactic acid organisms.

From what has been stated above, we may summarize the effects of lactic acid therapy as follows:

1. Objectionable proteolytic activity resulting in the absorption by the host of aromatic substances derived from protein decomposition by the action of proteolytic bacteria may take place in the intestinal tract

2. These aromatic compounds may be formed in the small or large intestines by the facultative or obligate proteolytic organisms.

3. An excess of protein in the diet of the host, or any factor causing stasis or impaired absorption of protein appears to be the direct cause of this condition. The result is an unusual amount of available food which stimulated the development of these proteolytic intestinal organisms.

4. The addition to the diet of easily fermentable carbohydrate, together with the restriction of the protein is of material assistance in reducing the output of these putrefactive products in many instances.

5. The beneficial action of the carbohydrate is a two fold one: first, the character of the metabolism of the facultative organisms tends to change from the putrefactive to the fermentative type, eliminating from the urine the putrefactive products referable to their activity, and secondly, the lactic acid bacilli, either those given by mouth, or those normally present in the intestinal canal, or both, proliferate rapidly, forming considerable amounts of lactic acid from this carbohydrate, and inhibiting the further development of the obligate proteolytic organisms by rendering the medium in which there are growing unsuitable for continued development.

6. The proteolytic bacteria may be producing their harmful effects either in the small or large intestine; in the former case, the introduction of organisms of the bulgarian type may be

reasonably expected to be of benefit, since we have seen that they tend to localize themselves in the small intestine. If, however, the proteolytic process is of large intestinal origin, the normal lactic acid bacilli of the acidophilus type are indicated. If there is reason to suspect that these normal intestinal lactic bacilli are enfeebled in their action, or absent it will be necessary to feed fresh cultures by mouth, or introduce them per rectum.

7. While the primary object of introducing lactic acid bacilli is to inhibit the objectionable activity of proteolytic organisms, it is possible, and indeed, experiments seem to indicate that in addition to the formation of lactic acid, other products associated with their development may be formed which also act beneficially. The nature of these products, and the character of their beneficial action however, is not definitely known.

In young children, more particularly those fed upon cow's milk, we may conceive of three distinct types of bacterial activity of an undesirable nature in the alimentary tract:

1. A true proteolytic type, characterized by the formation of putrefactive products, such as indol, phenol and oxy-acids.

2. A mixed putrefactive and fermentative process, in which proteolytic and facultative organisms act symbiotically, producing through their symbiotic activity considerable amounts of gas, and destruction of protein (casein). An example of this kind has been mentioned, in which the colon bacillus and an organism of the subtilis group energetically destroyed milk.

3. A true fermentative type, in which there is an unrestrained over-growth of true lactic acid bacilli. Salge has shown that in certain of his cases an enteritis resulted when the normal intestinal lactic acid bacilli of the acidophilus type proliferated to an unusual degree.

One not infrequently sees indications of this in infants whose diet has been for some time composed largely of Maltsupp or similar preparations. There is developed a gradually increasing intolerance for this food, and bacteriological examination of such cases not infrequently reveals the fact that *B. acidophilus* is present in greatly increased numbers.

Our knowledge of the whole subject of the application of bacteria in intestinal therapy however, is still far too fragmentary to warrant a discussion of the treatment of these cases. All that can be legitimately done, and all that this paper hopes to accomplish, is to bring together, to analyze and to summarize our present knowledge of this subject.

THE CLASS METHOD IN THE DIETETIC AND HYGIENIC TREATMENT OF DELICATE CHILDREN.*

BY
WILLIAM R. P. EMERSON, M. D.
Visiting Physician Diseasesof Children, Boston Dispensary; Instructor Diseases of Children, Tufts Medical School, Boston.

The problem of the treatment of delicate children is not a simple one. Its solution depends upon our finding the true cause, or in most cases the causes, of the condition and removing them. It is necessary for us to ask, "Why is the child delicate?" This question must be answered fully if we can expect anything but partial success in treatment. It is easy to blame heredity, yet most delicate children were healthy and normal infants. Home control, or lack of it, too rigorous climate, improper feeding, faulty environment, are but a few of the causes at whose door the charge is laid, and there is a tendency to dismiss the question without further debate. But we are to remember that Nature makes for health and usually succeeds, unless there are conditions too unfavorable for her to overcome. If, then, the child under our care does not improve in general condition it is safe to say that we have not carried our investigations far enough. The belief that adequate causes for a weak and debilitated condition can always be found by looking thoroughly into every detail of a child's life, should mark the beginning of success in its treatment.

Acting upon this supposition, in the fall of 1908, and again in the fall of 1909, the writer collected into a group, or class, fifteen of the weakest and most poorly nourished children out of the four or five thousand patients who had been coming to the Children's Department of the Boston Dispensary during the year, the object being to study every possible detail of their lives in the hopes that such a study would explain their condition, and that directions of hygiene and diet could be given to the group in much less time and much more effectively than to each one individually. The procedure was as follows:

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*Read before the eleventh meeting of the New England Pediatric Society, Boston May 21, 1910.

The past records of each child was considered carefully.

A new and complete physical examination was made to ascertain if there were any organic defects in the child's body.

The child's diet and home conditions were investigated as follows:

First. A small record book was given the child to be brought in at the next visit and the child or parent was directed to keep a complete record of everything the child ate and drank for the following forty-eight hours. The hours spent in sleep, the time spent out of doors, the exact number of minutes at meals, and such other details as seemed necessary in each particular case.

Second. A social visitor was sent to the house, where she filled out a special card, covering all essential points in the child's home surroundings.

Third. Another card was filled out in relation to the child's diet, habits at meals, and its likes and dislikes as regards the chief articles of food.

Based upon the data thus obtained, a talk was given the class as a whole, explaining a few essential points of hygiene and diet. The open air treatment was explained, the necessity of proper rest, the harmfulness to the growing child of tea, coffee and sweets. A few food values were given to show the need of cereals, milk and milk products in the diet. Positive directions were given rather than negative ones. The child was encouraged to substitute cocoa for tea and coffee; fruit, for sweets; simple puddings, for rich pies and cake.

Hesitation was felt in admitting a child to the class who had any functional or organic affection. However, the child making the best record of last year's class had marked mitral regurgitation. The second best record was made by a boy just recovered from chorea.

The class was held on Saturday mornings for one hour, from ten to eleven o'clock. The number was limited to fifteen.

As the child came in he was weighed and given a place on a long settee. The one who had gained the most in the preceeding week was placed at the head of the class and each one in succession in accordance to his gain or loss in weight.

The weekly report books were examined carefully.

The visitor in charge of the patient made her report and individual suggestions were made and directions given.

Where the child had gained in weight little was said, except in the way of encouragement. If, however, the child had lost weight, a careful study was made to ascertain the reason. It was surprising how easy it was to find the cause and upon the question and answer in such cases depended a large part of the value of the class.

The other children and parents were sympathetic listeners, eager to know the cause of the child doing poorly. The bringing out of practical points in this way constituted a most effective method of instruction.

A few moments each week were devoted to instruction in diet and the class dismissed at the end of the hour.

An analysis of the record of the class from November 1st, 1908, to June, 1909, shows the following facts:

Number in the class, 15, of these, five had a history of bronchitis; three of chorea; one, pulmonary tuberculosis; one, diphtheria; one, curvature of the spine from muscular weakness; one child had mitral disease; six had carious teeth; six were in an extremely nervous condition; six had an immediate family history of tuberculosis; ten had adenoid growths in the nose pharynx, five having been operated upon at least once and one child four times; three had no disease.

As regards diet, one did not like meat; four did not like milk; three each did not like butter, cream or eggs; all liked cereals in one form or another; five drank from one to six cups of tea or coffee a day; six had too many sweets; eleven ate too fast; one ate too slowly; eight washed their food down with water or other liquids.

The home conditions of all were fair, except one; six were much petted by their parents; the average age was ten years, one and one-half months; the average weight on admission was 58 pounds; the average amount under-weight was eight pounds one ounce; the average gain in from three to six months was five and three-tenths pounds each; the average gain weekly was five and seven-tenths ounces each.

Almost without exception it was found that if a child was absent from class more than one week he would lose in weight. Those coming most regularly made the best gains.

On June 1st there were six graduates from the class; that is, six children had gained normal weight and health. During the summer two more were added, making eight in normal health and weight. The other seven were in excellent health and lacked but a few pounds or ounces of being normal.

During the summer a place was provided for all of these children for summer outings and vacations. They were weighed again in the fall. Their average monthly gain during the summer was less than during the winter months when they were members of the class.

An analysis of this year's class shows: number in class, 15, of these, four had eneuresis; one had chorea; one sub-acute bronchitis; three had weak spines; four were extremely nervous; one had a tubercular family history; eight had been operated upon for adenoids; two not operated upon; six had carious teeth.

As regards diet, twelve drank one to six cups of tea or coffee daily; thirteen had too many sweets.

The home conditions of all were fair; the average age was twelve years; the average admission weight was 62 pounds; the average under-weight was 16 pounds 5 ounces each; one child was 28 and one half pounds under-weight; the total gain was seven and two-thirds pounds each; the average weekly gain was seven and four-tenths ounces.

Coincident with the gain in weight of these children, was a steady improvement in their general condition. The nervous symptoms largely disappeared. Three entirely recovered from aneuresis. The fourth who had this affection, was a child whose parents could not come to the class and who, therefore made the lowest gain, both in weight and in general condition.

During the winter, only two of the class had "colds" and none had bronchitis.

A comparison of the two classes shows this year's class thus far to have gained on an average one and seven-thenths ounces more per week than last year's class. This is accounted for, I believe, by the greater number of social workers. Last year one volunteer worker, not well herself, tried to do all the work. This year the class was divided among five workers, so that much more individual care could be given each child. The volunteer worker gave from one to three hours per week to the children.

The following were found to be the most important points of consideration in the treatment of these children by the class method:

Parents.—Mistaken ideas and mismanagement on the part of the parents is one of the chief causes of children being delicate.

In the class method the parents observe and learn; their intelligent co-operation is secured. Where the parents cannot come to the class, it is necessary that a social worker act in loco parentis, else the child does not gain.

The following case is cited to show how the attitude of the parents may prevent any improvement in the child:

Mrs. K. had three children, all poorly nourished, under weight and in poor physical condition. The following conversation was carried on with her:

"Mrs. K., your children are very delicate and sickly looking."

Mrs. K. "They have always looked that way; it is their natural condition."

"But they were healthy infants, were they not?"

"Yes, but they have never had any color since, and I do not see why they are not as well as other children."

After they had joined the class and did not gain well, it was found that the father was opposed to the open air treatment and did not think well of the hygiene suggested. He was induced to come to the class, his children were compared with other well children and he was convinced of their need of special care. With the co-operation of both parents the children commenced to gain immediately and continued to gain throughout the year. At the end of five months, one of them was slightly under weight, but the other two had reached normal weight and health.

Window Tents.—The Berkeley* window tent was used with about one-half of the class, where it was possible to obtain a window with the right exposure. It serves a double purpose; it gives fresh air to the child at night and also during the rest period in the day time, without cooling off the rest of the house. The mothers often use them with the child and are benefited. Stone heaters in the bed guard against chilling. The tent helps utilize rooms not otherwise suitable for sleeping purposes and the objection of more than one child occupying a room is largely done away with.

In stormy weather, or when the walking is bad or when the mother is too busy to go out, the child can still get its airing by the use of the window tent.

The frame of the tent can be made of iron tubing at a cost of fifty cents each.

The social visitor met the mothers on an afternoon and the coverings to the frames were made of denim, white canvas or khaki cloth. The whole cost of each tent was less than two dollars.

I have used these tents for about fifty children and find they like them, without exception.

In the first class five children using tents made an average gain of seven and three-tenths pounds. The rest of the class not using window tents, made an average gain of four pounds. Of the second class, seven used tents and made an average gain of eight and five-tenths pounds, while the eight without tents made an average gain of six and six-tenths pounds.

Diet and Proper Mastication of Food.—The dietary changes made were based upon the forty-eight hour list of food brought in by the child. The list, where proper, was unchanged. In other cases cereals were added, and the patient encouraged to take four glasses of milk daily, extra food being taken at 10:30 in the morning and at 3:30 in the afternoon.

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*The Berkeley window tent is simply an inside awning with fringe or skirt long enough to tuck in around the mattress. It can be drawn up during the day, keeping out neither air nor light.

The caloric value of the food taken by each child was estimated from the following rough measures:

Milk by the glass. Cereals and soft solids by the tablespoonful. Meat by ounces.

Before changes were suggested in the child's diet, he was taking from one thousand to fourteen hundred calories daily, with the addition of cereals, milk and cocoa, the value was increased from fifty to one hundred per cent., the average daily total being two thousand calories.

Every possible means were used to get the child to eat slowly, milk was taken from a spoon. He was instructed to chew his food as long as there was any taste in it and to avoid washing it down with liquids. The latter was accomplished by placing liquids entirely out of reach at the table. In the case of two boys who ate rapidly, it was necessary to persuade them to allow their mothers to feed them each mouthful until they could manage to eat slowly by their own efforts. One of these boys made no gain for three weeks, apparently for no other reason than for fast eating. The fourth week his mother fed him entirely, with the result that he gained a pound that week and continued to gain steadily afterwards until he reached normal weight.

From three to six glasses of milk were taken daily by all these children. It was found that if for any reason the child could not get this quantity of milk, he did not gain.

On two occasions the milk supply for two members of the class was stopped without the knowledge of the visitor. The discovery of this fact was made in each instance by the failure of the child to gain.

Schools.—In several instances it was necessary to take the child out of school for a few weeks, but in most cases the children attended school regularly. When the child was taken out he would make a gain almost immediately, showing that the public school is a great handicap to good health in children.

There are no open air schools in Boston for any but pronounced tubercular patients. The establishment of open air schools for all delicate children would, I believe, mark a great step in advance in preventive medicine.

Conclusion.—The class method is particularly adapted to the proper treatment of delicate children. The spirit of competition, the "game" in it, has a powerful attraction to the child, adding greatly in his control and management.

The steady gain in weight of children following directions furnishes a strong incentive to parents and child alike.

The taking of a cold bath in the morning, of a rest period during the day, of sufficient time at meals; the denial of tea and coffee, of sweets and confections; the going to bed in proper season at night; the deep breathing and irksome physical exercises; the taking of sufficient milk and proper food; obstacles too great for the authority of the parent and for the undeveloped reason of the child to overcome, yield in a surprising manner to the interest developed in class.

The class method makes the necessary instruction of the parents easy and effective. The results obtained each week remove prejudices and fears and convince in a moment, as if by magic, where hours spent in arguments fail.

In the giving of instruction and directions to the parents and children assembled together, there is an enormous saving of time. One hour a week for the whole class is sufficient.

The class furnishes the best training school for the social worker. It is here she can learn what instructions are to be carried out; what the object sought. She catches the spirit of the work and is enabled to relieve the physician of a large mass of detail, for which he has neither time nor energy, and for the execution of which, she is especially qualified, both by sex and by instinct.

Social Visitor's Report.

History No.

Name Address Age Date

House Stories No. of Rooms Balcony Flat-roof

Yard Locality Dust Sunlight Window for Tent

Sanitary conditions Sleep Bedtime Patient's room Occupants

Temperature room Ventilation Bath-room No. in family

Financial condition School Temperament

Intelligence of mother of father Patient

Family history Personal history

Date of joining class Date of visitor's first visit Time spent

Remarks Improvements suggested

Diet Card.

History No.

Breakfast Dinner Supper

Time at meals

Food between meals

Habits at meals

Drink-Tea, Coffee, Cocoa, Chocolate, Ice-water

Likes

Takes

Food- Milk- butter- cream- cheese- oatmeal- rice- cream of wheat- bread corn cake- potato- macaroni- eggs- beef- chicken- bacon- lamb- fish- beans vegetables- baked apples- prunes- custard- puddings- Indian meal mush.

SOCIETY TRANSACTIONS

New England Pediatric Society.

The New England Pediatric Society held its eleventh meeting on Saturday, May 21st, 1910, at 8:15 P. M. in the Boston Medical Library, Dr. Charles P. Putnam, President, presiding.

The following papers were read:

I. The Class Method in the Dietetic and Hygienic Treatment of Delicate Children, by Wm. R. P. Emerson, M. D., Boston, published in this issue.

II. Lactic Acid Bacilli. What they are and what they are supposed to do, by Arthur I. Kendall, M. D., Boston. Dr. Kendall's paper published in this issue.

III. Therapeutic Use of Seawater in Infants, by Robert M. Merrick, M. D., Boston.

The Value of Country Outings for City Children.—Dr. Morse in discussing Dr. Emerson's paper, said: I think Dr. Emerson is to be congratulated for showing us a practical method of applying the attention to details which we all, I suppose, give to our private patients and to a larger number of patients in dispensary practice So far as I know his record tonight is unique. It certainly points out an entirely new field. I was a good deal interested in what he said about the children not doing as well when they went away to the country in the summer. That, I believe, has been the experience of the French when they have sent children away from Paris to the country in the summer. These children almost always came back in poorer condition than when they went away. This was attributed to the facts that they were not so carefully supervised, that their food was often not as good as they had been getting at home, and that they often had to work harder than they did at home.

The Value of Nourishing Food in Tuberculous Children.—Dr. Murphy in discussing of Dr. Emerson's paper, said: There is one point concerning the class system which I would like to speak about and that is the one to which Dr. Merrick has already referred. I think Dr. Emerson has in a small way indicated work which might be done in a very large way with gratifying results. Hygienic measures now employed in the public schools fall short of the mark. I think the very fact that we show gain in weight in many of the children who are attending the tuberculosis class at Franklin Park is an indication that we should also adopt dietetic measures; that is, that the mothers should be taught in classes how to care for and how to feed their children. I think we are harping too much on the open air part of the public school system and too little on dietetic measures which should be used in every instance in order to get the best results. The children then instead of being what we call pretubercular, anemic and underfed would be a great deal stronger. At the tuberculosis school at Franklin Park each child has an active tubercular lesion in the lungs or gives a positive von Pirquet reaction. In many cases we get positive sputum. All are benefitted by the open air treatment but it is the proper feeding of the child which is doing so much in helping them along. I think that the class method which Dr. Emerson has used as applied to the mothers of the children is an excellent thing. If we could have open air rooms in the public schools on the roof or some other place, joined with a class system of teaching mothers how to prepare food and properly feed their children, we would make a long stride in the right direction.

Dr. Hastings in discussing Dr. Emerson's paper, said: I would like to ask Dr. Emerson if he had any difficulty in getting the children to take the milk. In private practice children often say they do not like milk and will not take it. Dr. Emerson said in his paper that only those who did take the milk made the gain, and I would like to ask if among the children of the poorer classes he has experienced any difficulty in getting them to take it.

Good and Ill Effects of Lactic Acid Baccilli.—Dr. Morse in discussing Dr. Kendall's paper, said: There are a number of points in Dr. Kendall's paper which, it seems to me, deserve special emphasis. One of them is the influence which the food has in modifying the intestinal bacterial flora. We are all very likely to forget not only this fact, I think, but also that it in many, if not most, instances renders the administration of bacterial cultures unnecessary. Another very important point is that the Bulgarian bacillus and other organisms of the same type act only in the small intestine and can be expected to do good only when the difficulty is located there. A most important point is that these lactic acid bacilli may do harm as well as good. Consequently if we use them in a routine way giving them freely in nearly every case, as so many do, we are perhaps just as likely to do harm as good. Judging from my own experience it is impossible to determine from the clinical signs and symptoms in what case they are likely to do good and in what case they may do harm. Another point which has been called to my attention pretty strongly recently by cases that have come to me after treatment by other physicians is that a good many physicians are attaching too much importance to the presence of indican in the urine. Some of them are making diagnoses of serious intestinal lesions and giving most unfavorable prognoses simply on this basis, drawing conclusions which, it seems to me, are entirely unwarranted.

Certain Bacterial Overgrowths Interfere with Digestion.—Dr. Talbot in discussing Dr. Kendall's paper, said: This subject is particularly interesting to me, as I have been studying the effect of the various food components on the digestion of infants from the chemical point of view and I believe that bacteriology explains certain things which chemistry does not explain that we observe in the feeding of sick babies whose powers of digestion are lowered. It is perfectly conceivable that an overgrowth of certain bacteria which were otherwise normal inhabitants of the intestinal canal may have a harmful influence on digestion. The whole subject is so complicated that it is impossible as yet to draw broad conclusions.

Therapeutic Use of Seawater in Infants.—According to Robert M. Merrick, M. D., the author of the paper, the use of seawater was suggested by the experience of Simon in his Boston lecture. The water was obtained off the "Grand Banks" and prepared according to the Simon technique. It was used in twelve cases of broncho-pneumonia, sixteen cases of congenital debility and nineteen cases of acute and chronic intestinal indigestion. The result on the whole, was poor in each class of cases and led to the conclusion that the subcutaneous injection produced no remarkable results and in the experience of the writer equally good results were obtained in some cases treated by saline solution. Emphasis was laid on the usefulness of saline isotonic solutions in general circulatory weakness especially as seen in infectious fevers.

The Use of Seawater in the Treatment of Edema.—Dr. Hastings in discussing Dr. Merrick's paper, said: Quite a number of these cases came under my care because I came on duty the first of January, Dr. Merrick's services ceasing in December. I am a little annoyed to see that the children did well in the pneumonia cases were mostly before I came on duty. Certainly after I came on duty and carried out the treatment as Dr. Merrick had started it, I was not impressed with the effect that the seawater had on them. I started a parallel set of cases who would be having salt solution, but after discussing the matter we found the amount of material was too small for that, and we thought it would be better to try and get fifty cases and see what would be the result with this treatment. One interesting thing, perhaps you caught it as Dr. Merrick read his paper, was the case of edema which seemed an effect from the subcutaneous use of seawater at first, but was relieved by doubling the dose. This was done at Dr. Leary's suggestion. I do not know any explanation of this and did not understand it at all at the time.

The class of cases at St. Mary's Infant Asylum which interests me most and baffles me most completely is these inanition cases, and after reading Dr. Simon's description of the wonderful results which would certainly come from the administration of seawater, and having tried all the different methods on successive sets of children and finding them steadily going to the bad, no matter what we did, I was quite enthusiastic to try the seawater treatment. This is the second set that Dr. Merrick reported, and you will see that they all did badly just the same whether they had seawater or not. After such a lecture as was given by Dr. Simon, in which he made such extraordinary claims both for the infectious diseases and for the inanition cases, it seems to me that such an investigation as Dr. Merrick has carried on ought to have a good deal of weight with us and help to eliminate undue authority which might otherwise be accepted from the words of a man who speaks with so great positiveness. Personally, I want to try the salt solution and give it in a similar series of cases and see whether we will not have just as good results, perhaps better, from the use of the normal saline solution as we do from the use of the fluid which the Frenchman thinks is "that out of which all animal life came."

Extract of Proceedings of the Georgia State Dental Society, June 14, 1910, at Piedmont Hotel, Atlanta, Georgia.

DISCUSSION ON DR. VISANSKA'S PAPER.

The President: We have with us, Dr. S. A. Visanska, who has enlightened us with a paper on the following subject: "Are the Teeth of Children Injured by the Local Effects of Eating Sweets?" The Medical and Dental men are indeed coming together. (Applause.) Gentlemen, the paper is open for discussion.

The Effect of Measles and Scarlet Fever on the Teeth of Children.—Dr. Barnwell: I am very much indebted to Dr. Visanska for the excellent paper he has presented to us tonight, and I am sure that the subject he has selected could not interest any one more than dentists. I think Dr. Visanska's conclusions about the effects of syphilis and other special diseases upon the enamel of the teeth is well founded. For instance, we say the conditions known as Hutchinson's teeth, which are teeth from syphilitic parents, have been well established and proven, and then again we see the conditions where the child itself has undergone some serious sickness, often measles, and especially scarlet fever. We find the effects of them in the enamel of the permanent teeth, and we can see it just as clear and tell the age when they suffered with that disease, showing that the arrest of development effects the enamel of the teeth and that it is one of the great cause of caries in children's teeth.

Dr. Visanska says he does not believe sweets injure the teeth; and does not believe that their local effects cause decay. We all know that Dr. Miller, some eight or ten years ago, advanced the theory and succeeded in proving,—to the satisfaction of the dental profession, that all decay commenced from the outset and the prime factor in the case was the fermentation not of sugar alone, but of starches and other substances taken into the mouth; that these substances form deposits on the teeth and bacteria developed, finally producing decay.

If such is not the case, why is it the point of decay always begins in inaccessible places, that is, between the teeth and down on the sides? The Doctor says he has treated children whose teeth have decayed that had perfect care, so far as the parents could give, but I venture to say that, in spite of the fact that the parents were trying to keep them clean they did not succeed; because we always find that the tooth has to be dirty, that is from a dental standpoint, in order to decay, and that the points that decay most frequently are those that are not reached with the brush. The Doctor does not think that the direct contact of sweets produces decay of the teeth. He says that largely the glucose is split up into alcohol and carbon dioxide. I was talking to a very eminent chemist upon this subject, one who has been connected with the dental profession for a number of years and he avers that glucose could be split up and that lactic acid was the direct result of this splitting, having the formula of $C_6 H_{12} O_6$ and it was quite possible for lactic acid to be present in the mouth, in quantities great enough to soften the enamel, and yet be unable to detect the presence of that acid by the litmus paper test. Many of us have come across the acid mouth. I do not think we find them very often, but we do find acid mouths occasionally, and whether that acid comes from fermentation in the mouth or from the stomach I am unable to say; but we do find these acid conditions, and it is my belief it comes from the splitting up of starches or sweets. I hold that sweets do injure the teeth directly. My practice has been, when a parent asks whether sweets injure the teeth or not, I tell them they will not harm the teeth of the child, if they thoroughly brush the teeth after eating sweets. In that way, I think we give good advice because all children will eat sweets, and if they will clean their teeth afterwards, they get the benefit of eating the sweets without any posibility of harmful after effects.

The Action of Lactic Acid upon the Child's Teeth. Dr. R. B. Adair: I do not want this subject to pass without an expression of appreciation for Dr. Visanska's paper. I know he is greatly interested in this line of work and I want to express my personal appreciation of this paper, and to say further, that not twenty years ago Miller and others were working along this line of research, studying the bacterioloy of caries in the teeth. They succeeded in producing caries in the teeth identical experimentally with caries of the teeth inside of the mouth, and they demonstrated that lactic acid was the direct cause in the production of caries and they concluded that the decomposition of food, starch and glucose which accumulates in the proximal surfaces of, and down between the little interstices of the teeth produce caries.

Instructions to Children for Use of Tooth Brush. Dr. Hughes: In the past year I have been fortunate enough to be thrown with Dr. Visanska a great deal and I think this Society is to be congratulated that they have advanced far enough to take up these problems in a scientific manner and I think the medical profession of Atlanta is to be congratulated upon having medical men take up these investigations and bring about results. I would like Dr. Visanska to give us the history of the "tooth brush drill" that he has instituted in certain localities, that is, instruction on the use of the tooth brush. I am sure of one thing, if these experiments are carried out it will benefit the teeth of coming generations. It has been overlooked in the past that the general physical condition affects the teeth so much. In this connection, Dr. Robin Adair spoke of a patient with typhoid fever. I am sure that were the truth known, his physical condition had affected his teeth as well as the typhoid state, thereby producing a favorable condition for the development of bacteria. While discussing the matter of decay of teeth with Dr. Visanska, I told him true lactic acid was the main factor in the decay of teeth. That is, lactic acid as brought about by the bacteria, and the way I think the quantities of sweets affect the teeth was that the glucose formed a favorable medium for the development of bacteria. The acid affects the enamel and decay follows. Personally, I want to thank him for the experiments he has been conducting and to wish him, with the entire Society behind me, success in his scientific research and experimentation.

The Effect of Pregnancy on the Infant's Teeth. Dr. Holland: About the cause of caries. We have more or less scientific men in the profession and one of them is Dr. Miller whose investigations yield daily benefits to us. If you will pardon me for the suggestion. We do know that during pregnancy there is a flow from the stomach during the period of gestation into the oral cavity, which has a most destructive action on the teeth. Even prophylaxis, carried to its utmost limits will not completely prevent trouble. In typhoid fever with stomach affections and other complications of that sort, we have a repetition of this condition, as well as in measles and scarlet fever, and particularly in the latter. Scarlet fever developed in my children, when they were about four and six years old respectively, and I am sorry to report that their permanent teeth were destroyed, which has been a source of great mortification to me. I would like very much to get the opinion of a man who has made researches upon this point.

Prophylaxis Against Caries in Children's Teeth. Dr. Hill: There is one point in Dr. Visanska's paper that seems to me to have been overlooked by the other gentlemen who have preceeded me, and that is, that no information has been brought out tonight as how to overcome the condition of lactic acid fermentation in the mouth, or to minimize its ill effects. Dr. Barnwell mentioned very particularly the fact that most parents do not know how to instruct their children to cleanse their teeth. I think that did strike the key-note. The fact is evident that practically three-quarters of all the decay occurs within the proximal surfaces, or in the sulci between the teeth, where food particles or other foreign substances become lodged and are not reached by the tooth brush. Several months ago the Atlanta Society of Dentistry had the privilege of hearing

Dr. Kells on this subject. If I remember correctly he brought out one point that was of considerable value to me. That is, up to the age of 16, his daughter did not develop a single cavity either in her deciduous or permanent teeth, for she was instructed, and not only instructed but the treatment insisted upon, that she, not only use the prophylactic tooth brush in such manner as to get between the teeth, but in addition the floss silk was run between each and every tooth at least twice daily, but the treatment did not stop there. In order to overcome the acid reaction of the mouth or the acetic acid that was developed in addition, his daughter's mouth was deluged twice every day with lime water, which, as you all know, is one of the best alkaline agents. This is heroic treatment, but as he states, "Good teeth are had at an enormous cost of time," and probably he should add "money" as well. I simply bring out these points that Dr. Visanska may know that dentists are working along the lines of cause and prevention, rather than how to cure same.

The Effects of Food on Dental Caries. Dr. Jackson: Food has a great deal to do with dental caries. We can determine almost by the appearance of the mouth the exact time when a child suffered with some eruptive disease, for instance, measles or scarlet fever, which affects the mucous membranes and cutaneous tissues of the body, leaving marks on the permanent teeth. They must be affected by the systematic condition of the mother before birth. The period of gestation is the time to develop good temporary teeth. As the Doctor mentions in his paper the germs of the first teeth are present about the sixth week of foetal life and therefore, the food from which these milk teeth are germinated is drawn from the mother's system. This period also affects the formation of the permanent teeth.

In this connection I remember reading that Dr. Oliver Wendall Holmes, when asked by a friend at what age he should begin the care of children's teeth, answered, "With their great grand-parents."

Dr. Visanska: There are just a few points I want to speak on. Dr. Barnwell has mentioned something about Hutchinson's teeth in children. Just as I said in my paper when the parents, or rather the father, has been mercurialized, iodized and boiled out at the spring the poison is still there and in such condition that it gets into the offspring. You do not find the typical injury to the teeth, but you find the decay there, which you cannot account for that will fool both dentist, doctor and friend. You do not always find the typical Hutchinson's teeth in children today. There are possibly some of the best people in Atlanta and everywhere else whose father or mother has been so unfortunate as to contract syphilis and they have been treated for it. From a medical standpoint the best authories state, if a man were treated for three years thoroughly, he was legally allowed to marry. He might be. But it is quite unfortunate that we do marry if we contract it, because it is going into the offspring, I don't care what precautions you take or advise.

A member: You do not believe it can be cured, Doctor?

Dr. Visanska: I believe in a few cases it might be called cured. I do not believe it is ever gotten out of the system entirely.

A member: You think that is referred to in the Biblical quotation, which says "The sins of the fathers are visited upon the children into the third and fourth generations?"

Dr. Visanska: Yes, sir, I do.

August 11th, 1910.

To the Editor of Pediatrics:

At the recent meeting of the Congress of American Physicians and Surgeons held in Washington in May, 1910, a joint session of the American Orthopedic and American Pediatric Societies was held and the subject of epidemic poliomyelitis was discussed. The following resolution was adopted:

"It having been shown by recent epidemics and investigations connected with the same that epidemic infantile spinal paralysis is an infectious communicable disease that has a mortality of from five to 20 per cent., and that 75 per cent or more of the patients surviving are permanently crippled, state boards of health and other health authorities are urged to adopt the same or similar measures as are already adopted and enforced in Massachusetts for ascertaining the modes of origin and manner of distribution of the disease with a view of controlling and limiting the spread of so serious an affection."

A committee with Dr. Robert W. Lovett, President, Boston, Mass., Doctor Irving M. Snow, Secretary, Buffalo, N. Y., was appointed to urge the various state and municipal health authorities to take up the work of investigation of the various foci of epidemic poliomyelitis, to study its epidemioligy and to instruct the public that the disease is at least mildly communicable.

May we ask you to publish this letter and the resolutions in your journal and also to allude to the matter editorially, urging the Health Commissioners of the various states of the United States and of the provinces of Canada to follow the example of the Massachusetts health department in studying the epidemiology of poliomyelitis.

Respectfully yours,

ROBERT W. LOVETT, M. D., President,
Committee on Poliomyelitis, American Orthopedic and Pediatric Societies.

IRVING M. SNOW, M. D., Secretary,
476 Franklin St.,
Buffalo, N. Y.

First Annual Meeting of the New Jersey State Pediatric Society.

The first annual meeting of this Society was held in the Hotel Chalfonte, Atlantic City, June 27th, 1910, the President, Dr. Henry L. Coit, presiding.

The officers were, President, Dr. H. L. Coit, Newark; Vice-president, Dr. Alexander McAlister, Camden; Treasurer, Dr. B. Van D. Hedges, Plainfield; Secretary, Dr. M. J. Synnott, Montclair, N. J.; Council, Drs. J. Finley Bell, Englewood; Thomas N. Gray, M. D., East Orange; Burdette P. Craig, Jersey City; Emery Marvel, Atlantic City, and F. H. Glazebrook, Morristown.

There was a large attendance of the members and also of other physicians. The opening session was held in the morning, when the routine business of the society was transacted, and three new members elected.

At the afternoon and evening sessions the following fourteen papers were presented in addition to the presidential address by Dr. H. L. Coit, on "Factors in the Conservation of Child Life;" "Treatment of Typhoid Fever With Special Reference to the Use of Hydrochloric Acid," Alexander McAlister, M. D.; "Acute Nephritis in Children," Arthur W. Bingham, M. D.; "The Status of Children's Wards in General Hospitals," J. Finley Bell, M. D.; "Some Points in the Diagnosis of Pleuritic Effusion in Infancy," D. J. M. Miller, M. D.; "The relation of Orthopedic Surgery to Pediatrics," Sidney A. Twinch, M. D.; "Infant Mortality in Summer: How to Conduct a Successful Campaign Against It," Arthur Stern, M. D.; "The Dietetic Management of Children During Sickness," Floy McEwen, M. D.; "A Method of Dealing with Illy-Nourished Infants," Francis H. Glazebrook; "Malarial Fever in Children," Elmer C. Wherry, M. D.; "A Present-day View of Infant Feeding," Thomas N. Gray, M. D;. "Practical Points in the Management of Poliomyelitis and its Sequelae," Prof. Henry Ling Taylor, M. D.; "Tuberculous Peritonitis in Children," John H. Bradshaw, M. D.; "Infectious Arthritis," David T. Bowden, M. D.

After the evening session a reception was held by the President and Mrs. Coit, the members, their families and friends, which was largely attended and greatly enjoyed.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE

Cardinal Principles for the Successful Feeding of Infants.—Dr. Thos. Morgan Rotch of Boston in a paper entitled "The Cardinal Principles for the Successful Feeding of Infants" deals with the subject of substitute feeding in a very clear and effective manner. This paper which is in the form of a catechism meets a long felt need, as up to the present the general practitioner has been unable to find concrete and authoritative information on this subject.

Dr. Rotch declares that care should be exercised in selecting the milk which is to be used for feeding of infants and young children. The question of supply of milk does not depend on the kind of animal goat, ass or cow, but on the quality of the milk. Different breeds of cows differ as to high or low percentage of the fats, sugars and proteid in their milk but these differences are not of great importance as all milk must be modified so as to suit the individual infant's digestion. The chief point to be considered is the proportion of the volatile and stable glycerides that exists in any given milk. The volatile glycerides are the elements in the fat most likely to produce indigestion, therefore, the milk which in its fat contents shows the smallest proportion of volatile glycerides is best suited for infant feeding. Human milk as well as the milk of the Holstein cow contains a small amount of volatile glycerides, whereas, the milk of the Jersey cow shows a high amount.

The Holstein milk holds the fat globules in a finer emulsion which is more easily restored than that of any other breed thus resembling in this respect human milk. When it is not possible to obtain Holstein milk use the milk of any common grade cow, such as the Durham, Ayershire or Devon but never that of the high grade cows such as the Jersey.

It is preferable to mix the milk of a herd rather than use that of a single cow, for if anything deleterious happens to the milk of one cow it is more likely to disturb the infant's digestion than if this milk is mixed with the unaffected milk of a herd.

To insure the success of the feeding, the following conditions are required: (1) an honest milk dealer, (2) a clean cow stable, (3) clean milkers, (4) healthy cows, tested for Tuberculosis, (5) absolute protection of the milk from dirt and bacteria, and a rapid delivery of the milk directly after milking to the house of the consumer, (6) absolute care to keep the delivered milk cold and clean in the infant home, (7) absolute cleanliness of bottles, nipples, and the hands of persons who feed the infant, (8) the proper intervals of feeding, (9) care to have the milk warmed from 98° to 100° F. and kept warm with a cozy throughout the feeding. The quantity of milk to be given an infant will depend upon its development, which is determined in a general way, by its weight. In most cases, starting with one ounce gradually increase to two ounces in two months, then three or four ounces, and by six months, six ounces, and by eight or ten months, eight or ten ounces, always watching the weight, the increase of which should be about one ounce a day for the first half year and one-half ounce a day in the second half year.

Dr. Rotch says that the modification of milk should be done in a laboratory equipped for this purpose, and by skilled laboratory workers as each case of feeding requires a different mathematical calculation. The problem is to to use the elements of the food stuffs—sugar, fats, and proteids—so that they can be digested and have sufficient caloric value for nutrition. As a rule indigestion in the milk-fed infant does not depend upon the fact that the food given is milk, but upon improper combinations of ill-advised percentages of the food-stuffs. The percentage method of feeding is simple, clear and precise. In an individual case you cannot at once say what a combination of percentages will meet with success, so it is best to start with low percentages and gradually increase each element in turn. If the infant is digesting well and is steadily gaining in weight, the percentages and caloric values of the food are correct.

While the gaining of weight and good digestion are points which show the success of the individual case of feeding, one must bear in mind that the food must also satisfy the required conditions for a perfect nutrition. An infant when fed on condensed milk, which has a very large amount of sugar (sucrose) in it, may gain rapidly in weight from an increase in its fatty tissues, but its metabolism may be so affected that the proper nutrition of the bones and muscles is interfered with and the infant develops rachitis.

The examination of the fecal contents enables one to determine exactly where the fault lies in bad digestion and the results tell us what constituents of the food are not being utilized or are the disturbing elements in the digestion.

In the digestion of the various elements of the milk, Dr. Rotch points out that the fat digestion of early life varies considerably with the age and the degree of development of the infant. The nutrition which is dependent on fat suffers when the percentage of fat in the food falls below one, and that the digestion suffers when the percentage of fat is above four. In the latter butyric acid fermentation may result directly from the glycerides of the butyric acid being broken up. It is to be remembered that butyrin is one of the volatile glycerids. The excess of fat beyond the capability of the individual's digestive power, is prone to cause spitting up or regurgitation or vomiting of soft flaky curds shortly after taking the food and the eructation of gas of a butyric, cheesy or rancid butter odor. The discharges are gray or white in color, dry or of creamy consistency, acid reaction, and of a rancid odor. There is usually very little gas formation. Fat curds in the fecal discharges differ from the curds of casein in that they are soft and small, whereas, the latter are large and tough.

Although there are five different classes of carbohydrates which can be used in infant feeding, viz: maltose (malt sugar), sucrose (cane sugar), starch lactose (milk sugar), and dextrose (grape sugar), the last one is the only one which is capable of being to any extent absorbed into the circulation. It represents the final product into which the others are changed before they are ready to be used for nutrition. Lactose is the sugar used in almost all cases, but when there exists lactic acid fermentation, it is advisable that maltose should be substituted, because lactose arrives at such fermentation much sooner than maltose. In cases where there is butyric acid fermentation, lactose should be used in the food because it is the sugar least affected by such fermentation.

In lactic acid fermentation there is a sharp acid odor of sour milk to the stool, and movement is loose, very acid in reaction, often causing excoriations of the skin around the anus. When the carbohydrates are in excess, those portions which escape absorption are first converted into lactic acid then into butyric acid and are then discharged with the feces as ammonium butyrate. The color of the stool is brownish or greenish and the odor is cheesy or like that of rancid butter. In using starch, either to act mechanically by breaking up the curds or for nutrition purposes, it must be remembered that the amyolitic function is not developed in the infant to any great extent before the eleventh or twelfth month. Dr. Rotch points out that the casein can be given in such small quantities that it is hardly necessary to use starch for its mechanical advantage. Starch as a nutrient is not so valuable because it taxes the digestion more than any of the other carbohydrates. Starch must be converted first into dextrin, then into maltose and finally into dextrose, which, for assimilation, is the end product; on the contrary, lactose, for example, is converted directly into dextrose. It should also be noted that when starch is given as a nutrient, the maximum amount which can be prescribed is about 1.30 per cent.

Dr. Rotch, in discussing the proteid digestion, divides the proteids of the milk into whey proteid and casein. This division enables one to have complete control of those cases having difficult digestion of proteid, despite the fact that they may require a higher percentage of the total proteid for their nutrition. It is wise to keep the percentage of proteids down to near the average need, because metabolism of the proteids requires more expenditure of energy and the products of such metabolism are more difficult of elimination than are those of the fats and carbohydrates.

The symptoms manifested in cases of excess of proteids are vomiting of large tough curds and the discharge of pale green and white movements, containing more or less large tough curds, having a marked odor more or less foul. The reaction is alkaline. The chief principle in the treatment is to keep reducing the percentage of casein, and if this is not sufficient the milk may be peptonized to the extent desired, *but remember that twenty minutes peptonization gives a decidedly bitter taste.*

In speaking of the alkalies which are added to the food mixtures Dr. Rotch calls attention to the fact that there are two reasons for producing a greater or less alkalinity in a food mixture and that both are closely connected with the effect which they have on casein: (1) a moderate degree of alkalinity is sufficient to favor the production of hydrochloric acid in the stomach and thus aids the digestion of casein; (2) to relieve the stomach from its work in connection with the digestion of casein by adding a lesser or greater amount of alkali, which delays partly the coagulability of casein in the stomach and passes it on to be taken care of in the duodenum. This fact may be made use of in cases of bad gastric digestion. Casein is a neutral organic compound forming both acid and alkaline combinations. Alkalies decalcify the casein and as a result the rennet cannot affect this proteid. The casein then forms with the acids of the stomach soft friable flakes, instead of tough curds. When sodoum citrate is used, it requires .20 per cent. to each ounce of milk and cream used in preparing the food to facilitate the digestion of the proteids and .40 per cent. to prevent the action of the rennet, and to insure the formation in the stomach of soft curds instead of tough ones.

Bicarbonate of soda may also be used. For general routine lime water is the alkali which usually answers sufficiently well.—M. O. Magid, M. D.

Practical Infant Feeding—Feeding Formulae.—In the introductory paragraph, Dr. Joseph E. Winters emphasises the fact that in the last quarter century the mortality of infants was rather high and constant, due to the lack of knowledge of the physiological necessities of a growing infant, and of the meager nutritive value of the superfluous foods. He says that the mortality of breast-fed infants whether they are reared in the institution, in the hovel or the mud-hole is no higher than that of those who live in the most salubrious homes. The breast-fed infant is seldom ill and rarely comes under a physician's care. In a breast-fed infant the nutrition, development, vigor, rosiness and animation are proportionate to the fat ingredient in its mother's milk.

The latest analysis of Dr. S. Engle shows the following composition of mother's milk, Fat-5.01 per cent., Proteid-1.29 per cent., and Milk Sugar-6.98 per cent. When mother's milk or an artificial food is seriously deficient in fat there are identical stamps of profound innutrition, i. e., depressed fontanelles, sunken intercostal spaces, anemia, innanition. Restore breast milk with an ample supply of fat or an exact conterpart in an artificial food, and plumpness, firmness, rosiness, animation, joy of babyhood supersede pallor and apathy. That fat is vital in the nutrition of young animals is evident from the large proportion of it in the milk of animals To sustain heat, respiration and nervous energy in a new-born child fat must be present in the food in large amount. The expenditure of heat is 130 calories per kilogram of body weight in an infant five months old; 91 calories in a child one and one-half years old; 35 calories in an adult. The large and rapid heat loss makes an ample supply of the pre-eminent body fuel, fat, a physiological necessity.

Fat indigestion is not brought on by the presence of a large percentage of fat in the milk, if such fat is allowed to rise slowly by nature's method. Each globule, by molecular attraction, is surrounded by a stratum of proteid which prevents the globules from uniting with each other. Centrifugal cream has the molecules of fat more coherent as the result of the destruction of the stratum of proteid. The resulting conglomerate fat has difficulty in passing the infant's pylorus, owing to its small size, and is decayed in the stomach from reaching the secretions for fat digestion. Gravity cream from cows of average grade, properly modified, is perfectly digestible by the youngest and most delicate infants.

Proteid exists in woman's and cow's milk in two forms, albumin and casein. Albumin which is not coagulated in the stomach constitutes two-thirds of the proteids in the woman's milk and passes through the pyloric opening readily, whereas, the casein, which constitutes four-fifths of the proteids of the cow's milk is coagulated in the stomach,—into tough leathery masses, and finds no little difficulty in passing the small pyloric opening, causing delayed emptying of the stomach, also more work for this delicate organ.

Dr. Henry C. Sherman in an analysis and coagulation experiment of skimmed milk and top cream reports that skimmed milk 16 hours after milking contains, total proteid 3.89 per cent.; casein 2.99 per cent. When skimmed milk is diluted with water and lime water as for feeding and is acidulated at feeding temperature it yields a few tough curds, which on stirring stick together and sink. In treating top cream in same manner, and using the upper one-half ounce from each of four quart bottles of milk, it yields an immense number of finely divided light feathery flocks which float in the solution and are easily reduced to a semi-emulsified condition by stirring.

The physical behavior of the proteids in the different layers of cream in a quart bottle of milk varies with the amount of cream used in the mixture. The smaller the quantity the finer the curd. This being the case, more than one bottle of milk is necessary to meet the requirements for nutrition, as Dr. Winters recommends that the upper one-half ounce or one ounce or two ounces, etc., etc., of each bottle be used.

It is a known fact that every mother that does not nurse her child for at least six weeks after delivery has as a result incomplete involution. The uterus contracts powerfully every time the infant seizes the nipple when commencing to nurse. Dr. Winters says that after six weeks nursing a child can readily digest a properly modified cow's milk.

Every breast-fed child should have one bottle from the third week on and two bottles after the first month, to allow the mother the much needed rest at night and the desired freedom by day. This gradually accustoms the digestion to an artificial food, thus making weaning at any period very easy.

With a superior quality of woman's milk as a standard, a substitute to equal this can readily be made from gravity cream properly modified. For the first week's use milk must be sixteen hours old and only the top one half ounce of cream of two or three quart bottles must be utilized. The ratio of fat to proteids in the upper one-half ounce is eight to one.

Dr. Winters emphasises the importance of not using pasteurized milk in the feeding of infants, because by the heating, the organic union of the proteid and mineral constituents is broken; the minerals in the food are not absorbed unless they are in organic union with the proteids. Pasteurized milk used for a continued length of time induces susceptibility to disease, impairs resistance and increases the death rate.

To secure perfect nutrition of bottle-fed infants the regularity of feeding and the proper proportions of the constituents of the food are absolutely essential. The feeding formulae are compiled with the object of enabling the nurse or mother, who is to care for the infant, to prepare the food for the particular baby according to its needs, as shown by its digestion and its weight. Good food is constantly adjudged faulty when the fault lies in its preparation. One unsuitable food after another is often substituted, sometimes with fatal consequences.

Dr. Winters says that the feeding of an infant is an exact science founded on infant physiology, physiological chemistry, and the knowledge of the physical behavior of milk. One devoid of a knowledge of this science is in darkest Egypt when directing the feeding of an infant. Notwithstanding the complexity of this science, feeding charts emanating from promoters of patent (vegetable) foods are suffered to direct the welfare of a precious child. —M. O. Magid, M. D.

Soy Bean as an Article of Diet for Infants.—In the Journal of the American Medical Ass'n, Dr. John Ruhrah tells us that the Soy Bean which is used as an article of diet by the natives of China and Japan and contains in its composition a high percentage of proteid, has been used by him in the substitute-feeding of infants.

The bean not being available in most of the markets, the writer has succeeded in interesting a manufacturer to make a gruel flour of this bean. The percentage of protein in the flour is 13 gms. to the ounce and yields 120 calories. This flour can be used (1) as a gruel, (2) in broths, (3) in making biscuits or muffins. It can be mixed with cereals.

In summer diarrheas and certain forms of intestinal disturbances a weak gruel of one or two level tablespoonfuls to the quart of water will be found of great value. As a rule it is well borne and digested and rarely causes vomiting or an increase in the diarrhea. Later, cow's milk or condensed milk may be added to the gruel.

As a diluent to the cow's milk it is of value when used in the strength of four level tablespoonfuls to the quart (Protein 1.4 per cent.) When using condensed milk it is advantageous to use this gruel as a diluent as it supplies the proteid which the condensed milk is lacking. In cases of marasmus and in cases where cow's milk is not well borne the soy-bean gruel may be added as a diluent.

The Caloric values of gruels made of the soy-bean flour is as follows:

Amount.	Protein. %	Fat. %	Sugar. %	Calories.
¼ oz. (1 level tablespoonful to quart)	.35	.15	.08	30
½ oz. (2 level tablespoonfuls to quart)	.70	.30	.15	60
¾ oz. (3 level tablespoonfuls to quart)	1.0	.45	.23	90
1 oz. (4 level tablespoonfuls to quart)	1.4	.60	.30	120

Amount	Protein. %	Fat. %	Sugar. %	Calories.
2 ozs. to quart	2.8	1.2	.60	240
3 ozs. to quart	4.2	1.8	.90	360
4 ozs. to quart	5.6	2.4	1.2	480
5 ozs. to quart	7.0	3.0	1.5	600
6 ozs. to quart	8.4	3.6	1.8	720
7 ozs. to quart	9.8	4.2	2.1	840
8 ozs. to quart	11.	4.8	2.4	960

The caloric requirements of the infant are about 45.4 calories for each pound of body weight during the first three months of life; about 40.9 during the second three months and about 36.4 to the pound during the second half year. If six level tablespoonfuls of the flour be used in making a quart of gruel, a satisfactory strength, 32 ounces would contain 19 gms. of protein and 180 calories, being equal in protein to the same amount of average mother's milk, but contains about 400 calories less food value on account of the low fat and sugar contents. This fact should be borne in mind in using soy-bean gruels.

To make gruel, add one level tablespoonful up to six ounces of the soy-bean flour to the quart of water. Boil for 15 minutes, adding water to make up for loss by evaporation. Add salt to taste. These gruels, not containing any starch, do not thicken, and settle readily on standing. To overcome this add one to two teaspoonfuls of barley, oat, or wheat gruel flour before cooking. —M. O. Magid, M. D.

A Clinical and Roentgenographic Study of the Essential Differences between the Physical Findings in Childhood and Adult Life.— Abstract of paper read at the A. M. A. meeting in St. Loius, June 6th, 1910, by Dr. Louis A. Levison, and Harry Dachtler, Toledo, Ohio. Seventy children under the age of 12 were studied by the teleoroengtenographic method. A tube distance of one metre was adopted, a distance allowing more accuracy than a distance of two metres in adults. All children old enough to stand upright were examined in the upright position face to the plate. This method reduces the apparent enlargement of the heart and great vessels to a minimum, so that it can be virtually disregarded. The results obtained by this method are practically as accurate as with the orthodiagraph. The roentgenographic plates were compared to the percussion findings with a view of controlling the latter. Especial attention was given to the thymus and the heart. The thymus produces normally very slight impairment of resonance. The roentgenographic shadow is exceedingly difficult to outline on account of its anatomical location, merging its shadow with that of the spinal column sternum, and great thoracic vessels.

The demarcation of the heart borders in terms of bony landmarks does not offer a fair comparison with adults, owing to the continual change in the development of the bony structures. Absolute heat dulness in children can be quite accurately determined by very light percussion and the results confirmed by the roentgen rays. The relatively great volume of the great thoracic vessels in young children offers the greatest difficulty in determining the heart size by physical methods only.—*E. W. Dittrich.*

Treatment by Seawater Injections.—(*Journ. Amer. Med. Assoc.*, January 1, 1910). Le Boutillier advocates the subcutaneous injection of sterilized and diluted seawater in cases of inanition, malnutrition, and chronic indigestion. A dilution of eighty-three parts of seawater obtained well out at sea, and from a sufficient depth to insure against surface contamination, is made with 190 parts of pure spring water, passed through a Berkefeld filter and put up in sterile bottles. This is isotonic with blood-plasma, and in it leucocytes will live when kept at blood temperature. The dose varies from 10 to 60 c.c. according to the age of the patient and the urgency of the case, and injections are given from three times a week to every day for a short period, the amount being increased until the desired effect is produced. The duration of treatment varies from two or three weeks to four or six months. The injections are unaccompanied by pain or other disturbance, though there may be a slight rise of temperature following the first or second injection and some discomfort at the site of the injection owing to the distension of the tissues by the fluid. Marked improvement in nutrition ensues, the stools are rendered more normal and the appetite increases, while colic is soon allayed. The skin becomes more moist and healthy sleep is induced.

Latent Diphtheria, a Problem of Public Hygiene.—Myer Solis-Cohen reports upon 27 cases of slight and apparently harmless throat trouble, the cause of which he was able definitely to trace to the B. diphtheria or pseudo-diphtheria. These so-called "latent cases" of diphtheria, under which term most likely is included the majority of the so-called "healthy bacilli-carriers," are considered by Cohen to be the chief cause of the spread and of the non-extinction of epidemics of diphtheria. Acting upon this idea, which almost certainly appears to be correct, he brings forward some practical and some very far-reaching proposals. The B. pseudo-diphtheria, he wishes practically to be regarded as equivalent to the B. diphtheria, and arrives at these conclusions:—

1. The frequency of diphtheria is a result of the want of surveillance of the latent cases and of the so-called "bacilli-bearers."
2. Diphtheria can run its course without the formation of false membrane, and may only give rise to very few symptoms.
3. Cases of latent diphtheria ought to be isolated, until two negative cultures have been obtained in succession.
4. All cases of sore throat should be notified to the sanitary authority, and be submitted to bacteriological examination.
5. Those who have come in contact with cases of diphtheria ought to be recognized as infected, and should be excluded from schools and factories. They should only be allowed at large when two successively negative cultures have been obtained.
6. Every person, who has come in contact with a diphtheria patient at home, at school, or in a factory, should be "swabbed."
7. The disinfection of the room is not sufficient, and the confidence placed in this is delusive. Animate infection-carriers are more dangerous than inanimate.

The wholesale adoption and carrying out of these suggestions, which are veritable counsels of perfection, would meet with very considerable practical difficulties.—*Jour. Amer. Med. Assoc.*

Treatment of Convulsions in Infancy and Childhood.—Professor McKee writes on this subject in the *Therapeutic Gazette*. He considers that while the mother is waiting for medical help there are probably few measures, to which she may resort, more efficient than the old-time mustard bath. Care must be taken as to the temperature of this to avoid scalding. If the child is still convulsed on the arrival of the medical man, he should promptly anesthetize the patient with chloroform. Whilst the patient is anæsthetized it is good practice to wash the bowel out with warm normal saline solution, leaving several ounces to be retained. If the temperature is high the saline solution should be used cool or even cold. If need be, the stomach should be washed out rather than be acted upon by an emetic. Calomel should be given in one large dose or in a series of small doses, and it is well to follow the calomel with a dose of castor oil. Recurrence will be prevented by good sized doses of bromides and chloral. The latter is best given *per rectum* in starch water. McKee never has recourse to morphine, and has had no experience of hyoscine. After the storm, complete rest of body and mind must be ensured for some days.

Hypodermoclysis with normal saline given at a temperature of 104° or 105° is most valuable. If the temperature of the patient is high or rising rapidly, the cold-pack is not only anti-spasmodic, but it may save life.

Treatment of Tuberculosis in Children.—Nobecourt (*Jour. de Med. de Paris*) states rest, fresh air, and general hygiene are the keynotes in the treatment of tuberculosis in children. The question of climate, country, or seashore life is important, but secondary. Rest is absolutely necessary in articular tuberculosis, in febrile conditions, and in the period of cachexia. In other cases the dosage of rest must depend on the temperature, pulse, and general condition. Every tuberculous subject who is losing flesh or having fever must be kept in bed or in a reclining chair; in other cases repose is only relative, the patient taking several rests during the day interspersed with walks, all violent exercise being interdicted, or anything that will cause fatigue. Cerebral fatigue must be prevented as well as physical. Fresh air must be given all the time. Life in the city renders this impossible, since the air is more or less vitiated; life in the country must be substituted, but which is of little account, since cures may be obtained in all climates. It is of advantage to place the child so that he can have the proper fresh air and yet not have him separated from his parents. Fresh air schools are valuable. Sea air seems to be especially favorable for joint tuberculosis, glandular affections, and peritonitis. It must be prolonged for months or years to effect a cure. In early pulmonary tuberculosis, especially when associated with tracheobronchial glandular affections, and in apyretic cases sea air still does good. It is in advanced febrile cases that mountain climates are preferable. Cold sea baths are contraindicated in children under three years of age, and in nervous subjects whose reaction is poor; they may be given to those with closed external tuberculosis. In pulmonary cases they should be reserved. Warm baths in the tub may be given to all.

Tonsil Research.—Richard B. Faulkner, Pittsburg, Pa., advocates more conservatism in removal of the faucial tonsils. The tonsil is a natural organ, and should not be removed any more than any other natural organ. The mouth is an acoustic cavity, and if you alter the shape by removing the tonsils you will necessarily change the voice. The faucial tonsil is an important phonetic organ and has other important mechanical functions. Medical and philological research in regard to the tonsils is needed badly. The lymph current near the tonsils is less active than that of the pharynx at some distance and there are lymphatic spaces around the tonsils and a system of closed canals in the follicles which do not open into any near reticulum. The external deep surface of the tonsil is surrounded with a fibrous capsule. Exposure and disease change the structure of the tonsils; cell infiltration and cicatrical tissue render absorption impossible. Blood and lymph vessels undergo compression and atrophy, rendering absorption less. The tonsils are not absorptive organs. Tonsil diseases are not fatal, but many patients die from tonsil operations. Diphtheria and other infections are less severe when they involve the tonsils and not the pharynx.—*Medical Record*, July 9, 1910.

The Early Diagnosis of Infantile Scorbutus.—Henry Koplik (*Archiv of Diagnosis*, 1909, ii) states that scorbutus may develop in any infant whose food is or has been constructed on denutritional lines. It is a mistake to reject the possibility of scorbutus in a patient fed upon the breast or raw milk, since breast milk may have a denutritional composition, and raw milk be given in a denutritional state. Another element in the etiology of scorbutus is its intestinal source. The metabolism having become deranged, a development and invasion of toxins through the gut probably adds to the symptom complex. The ingestion of sterilized food in itself cannot explain all the phenomena of the disease, and many infants take sterilized food without developing scorbutus. The disease is uncommon in infants under five months. The first signs of incipient scorbutus are, a mild form of anemia, pain in the joints or bones elicited only by pressure, and the appearance of blood in the excretions or in the vicinity of bones or periosteum. In an otherwise perfectly healthy infant, fed on pasteurized milk, hematuria was the only gross symptom. Closer examination revealed a very mild anemia, a slight line of redness along the gums, and tenderness of the tibia only on deep pressure. Antiscorbutic treatment rapidly cleared up these symptoms, which otherwise would have developed a full picture of scorbutus. An infant, aged eleven months, was placed on a raw milk mixture containing excessive fat (7 per cent.) It gained satisfactorily until it developed a slight temperature above normal, a slight tenderness on manipulation of the left thigh and leg. The teeth and gums were normal except that there was a small, bluish-red cushion over the situation of the left lower canine, no tooth being felt. A diagnosis of osteomyelitis had been made, there being a high leucocyte count. The diagnosis was scorbutus (due to the excess of fat in the food), causing the pain in the thigh and hemorrhage in the left canine tooth-sac. Upon a proper food the infant made a complete recovery. It is not uncommon in infants of about six months who are apparently thriving, to find tenderness over the tibia on deep pressure. Such infants may have rickets, but the tenderness in question is scorbutic, and the test of correctness of the supposition is the rapid response to a change of diet aimed at warding off a full development of scorbutus.

Gastroenteric Toxemias of Bottle-fed Infants in Summer.—J. A. Hulse (*Jour. Amer. Med. Assn.*, 1910, liv. 1125) outlines a number of general principles to be observed in the treatment of this infection. The withholding of all food for at least three days is imperative; after that time barley water may be given. The child should rest in bed out of doors. No child should be permitted to creep or to sit up even if apparently able to do so. The toxins should be eliminated by stomach washing, colonic irrigation, and catharsis. If the physician is called in early, there is no procedure so valuable as stomach washing, using boiled water at a temperature from 100 to 110° F., to which maybe added a small quantity of lime-water. Two drams of castor oil should be given though the tube before its withdrawal—a thorough colonic irrigation should follow, and after the stomach is settled cooled boiled water may be given freely by the mouth. In cases seen a little later, stomach washing is not indicated unless that organ is irritable, but colonic irrigation should be done every four hours the first day of treatment—after that twice daily is usually sufficient. This should be followed by nutritive enemata at intervals of four hours. The rectal feeding should be continued until it is safe to begin feeding by mouth. Of measures to control temperature and restlessness, a tub bath is best. The child can be in the tub from ten to twenty minutes out of every two hours if necessary. An ice cap to the head is useful. The following measures may be used to allay the inflammation: In addition to rest in bed and after through cleansing of the alimentary canal, bismuth subnitrate may be given, from one to two drams daily, for a child one year old. Salol, one to two grains every three hours, is of some benefit as an intestinal antiseptic. Opium is indicated if there is much pain and continued frequent stools. It should not be given if cerebral symptoms and high temperature are present. For prostration, brandy should be administered by adding it to the boiled water, which the infant takes to allay thirst—one-half ounce in twenty-four hours. Hypodermoclysis may be necessary in the graver cases. During convalescence tonics are indicated, and beef-juice should be given freely. Removal to the country or seashore in those cases in which relapses are prone to occur will accomplish more than anything else in restoring the infant to health.

Myelogenous Leukemia in a Child.—Whiphman reports the case of a child eighteen months of age, who was healthy until one year old, when he began to waste. The father gave a history of untreated syphilis. The child was unable to sit up. The fontanelle was wide open. There was no bossing of the skull. The ribs were slightly beaded, but there were no epiphyseal enlargements. The lymphatic glands were just palpable and somewhat hard. The spleen extended to the middle of the abdomen, and four and one-half inches below the umbilicus. The liver was enlarged. The blood count was as follows: Red cells, 4,080,000; leucocytes, 63,400; hemoglobin, 80 per cent. The differential count showed: Polymorphonuclears, 32.4 per cent.; lymphocytes, 5.2 per cent.; large mononuclears, 18.8 per cent.; transitional, 12.8 per cent.; eosinophiles, 2.6 per cent.; basophiles, 0.6 per cent.; neutrophile myelocytes, 25.8per cent.; eosinophile myelocytes, 1.6 per cent.; normoblasts, 1.6 per 100 leucocytes. Subcutaneous hemorrhages occurred upon the extensor surface of the right a m, or the right shin, on the scalp, left ear, left eyelid, and left side of the face. The child had been under observation one month, and was getting worse; the leucocytes had risen to 101,000. The child had received X-ray treatment without evident effect. The author refers to thirteen known cases of myelogenous leukemia in children. The earliest reported was four months of age.—Proceedings of the Royal Society of Medicine.

Treatment of Whopping-cough.—Berliner has introduced still another method of treatment of whooping-cough. There is already a lengthy list of drugs recommended for use, but one and all prove unsatisfactory in practice. Berliner uses quinine in a special method, finding that the insufflation of this drug into the more frequently produced paroxysms of coughing. For the last two years he has been using in all cases of whooping-cough an ointment containing 15 to 40 grains of quinine in two and one-half to four drachms of lard, according to the age of the child. Three or four times a day into each nostril is introduced a pellet of this ointment, about the size of a pea, by means of a glass rod. The child is laid upon its back so that the ointment may penetrate to the deeper parts of the nasal cavity. In one of his cases the improvement was immediate, but, as a rule, considerable benefit was secured at the end of three or four days. The paroxysms not only decrease in number but also in severity. The fit of coughing subsides into an ordinary cough as it gets less frequent. Some relapses occur, but they yield to renewed treatment. The treatment is so much the more effective the younger the child. The general convulsions consequent on the paroxysms in children under two years of age cease, as a rule, as soon as this treatment is started. The method is easy of application, which is by no means its least recommendation for practice.—*Munch. medizin. Wochenschr.*

The Importance of Pediatrics and the Position of Surgical Pediatrics in the College Curriculum.—The importance of pediatrics as a study in our medical schools and recognition of the surgical diseases of children as a department of study was among the admirable features of the report on curriculum presented at the meeting of the Association of American Medical Colleges held in Baltimore in March. The report placed the minimum number of hours to be devoted to pediatrics at 150, which is an increase of 50 per cent. over the present requirement of the Association, and yet is a very modest share of the 4000 hours of the clinical years (the third and fourth years) of the college course. Dr. H. D. Arnold of Boston was chairman of the subcommittee on curriculum for the clinical years, and Dr. S. W. Kelley of Cleveland member representing pediatrics. The report goes on to say, "The allowance for pediatrics is intended to include instructions in the exanthemata. In many other ways medicine and pediatrics overlap. Useless repetition can only be avoided by a proper understanding between the teachers of these two subjects, and a certain elasticity should be allowed a school for the purpose of assigning time to one subject or to the other according to where the borderland subjects can best be taught. In the same way pediatrics and surgery touch and overlap. In one subject or the other the surgery peculiar to children should receive attention. Valuable suggestions in relation to the teaching of pediatrics will be given in an appendix to this report.

Epilepsy in Children and its Treatment with Bromide.—Boncour (*Prog. Med.*) says that, although the bromide treatment is the best for epilepsy, its success depends greatly on the method of administration and the attention given to the details of diet and hygiene. It is indicated in all cases in which convulsions are present and should stop all motor phenomena, but in cases of petit mal, without any convulsive movements and of mere dizziness, it is less successful. The cause of the attacks should be carefully sought out and as far as possible removed. A daily history card kept by the parents is a great aid to the physicians in the knowledge of the number and type of convulsions, and thus of the effect of bromides. The bromide must be given in sufficient quantity and for a sufficiently long time, generally for several years. He prefers a mixture of the three bromides, sodium, potassium, and ammonium, to which he adds in some cases calcium bromide. The dose must be carried up to a point at which the motor manifestations are controlled without marked bromism, and must then be kept at that point for months or years. Irregularity and lowering of the dose without permission is responsible for most of the failures. A great aid to the effect of the treatment is given by restricting the amount of chloride of sodium that is used with the food to a small quantity. The bromide is then effective in smaller doses. It should be continued three years after the last attack.

Endocarditis in Typhoid Fever in Children.—By Dr. Stepowski (*Theses de Paris*, 1908-1909, No. 4; Ref., *The British Journal of Children's Diseases*, February, 1910, p. 85). The author has collected sixteen cases from literature in children whose ages ranged from three to fifteen years, including an original case. Endocarditis is a rare complication of typhoid fever, but is a little commoner before fifteen years than later. It is most frequent at puberty, and is commoner in girls. The mitral valve is usually affected. In six cases endocarditis was associated with a pre-existent myocarditis and in four with pericarditis. The complication is rarely due to typhoid bacilli, but is usually the result of secondary infection by strepto or staphylococci. It may often escape detection. The prognosis should be guarded, owing to the possibility of cerebral and pulmonary embolism.

Treatment of Paralytic Deformities.—R. W. Lovett (*Bost. Med and Surg. Jour.*, 1910 clxii,479) ascribes the greater success obtained at the Children's Hospital, Boston, recently, to certain changes in operative methods more careful selection of cases and greater care in the correction of deformity. Tendons have been inserted into periosteum, and tendon-to-tendon attachment has been abandoned. The use of silk extensions has proved satisfactory and has given an added range and flexibility to the operation. The transferred tendons have been attached with such tension that when the limb was held in the overcorrected position they were moderately tight. The period of fixation now in use is from six weeks to three months. After the fixation plaster is removed, a supporting brace is worn until six months or a year after operation. From the time of the removal of the fixation plaster, massage and muscle training of the transferred muscles is followed out in cases where the patients live near enough to the hospital to avail themselves of it. Simple operations have been preferred to complicated ones, and the splitting of a muscle and its use for two insertions has been largely abandoned and the entire muscle transplanted. The use of silk ligaments in the ankle-joint as supplementary to tendon transference has proved of the greatest value. In some instances the results are brilliant; in some, the extent and character of the paralysis prevent us from obtaining as good functional results as we would desire.

The Detection of Blood in the Stools.—By Dr. M. Triboulet, (*Societe de Pediatrie*, Paris, December 21, 1909; Ref., *The Brit. Jour. of Children's Diseases*, February, 1910, p. 82). The author finds the reaction to phenolphthalein superior to that with guaiacum and benzidine, the risk of error being less, and also because it facilitates the discovery of traces of blood of digestive origin and clinically unsuspected, as in cases of (1) old standing purpura, Barlow's disease; (2) violent intestinal reactions with ecchymoses, acetonemic disorders in young children, entero-colitis in older children simulating appendicitis; (3) various intestinal complications in pneumonia,measles, scarlatina, and diphtheria. Intestinal discharges, like those met with in certain cases of uremia, connected with congestion of the digestive mucous a membrane and bloody exudation mixed with the stools, are detected in most cases only by the red reaction with phenolphthalein.

BOOK REVIEW

The Diseases of Infants and Children. By Edmund Cautley, M. D., Cantab., F. R. C. P. London., Senior Physician to the Belgrave Hospital for Children; Physician to the Metropolitan Hospital; formerly casualty physician and Assistant Demonstrator of Physiology at St. Bartholomew's Hospital. Handsome buckram binding 1023 pages, $6.60 net. London, Shaw & Sons, 7 and 8 Fetter Lane, E. C., Printers and Publishers, 1910.

During the past decade the study of ailments of infants and children has undergone many changes. Scientific methods, accurate pathological observations and patient research have effected a complete transformation in the whole subject so that the pediatrician and general practitioner is really in need of a new systematic treatise, pervaded by the fresh spirit so recently infused into this specialty. The author of this work, from a long practical experience in diseases of early life and the examination of large numbers of children and the extensive study of the literature on this subject is in position to write authoritively and he has courageously undertaken to produce a work that will achieve unqualified success. As a teacher he is known to be incisive, direct and lucid, bringing considerable skill to solve the difficult problems of diagnosis, and he has an extensive fund to draw from as an accurate therapeutist. His main object has been to supply a work in a form suitable for the specialist in diseases of children, as well as the general practitioner of medicine.

It is to be noted that the title contains the word "infants," and the promise implied therein is well redeemed because a very adequate amount of space is devoted to the medical needs of the new-born. Dr. Cautley includes all children under two and a half years in the category of infants; perhaps it would be better to limit the term to children who have not attained the power of speaking, at any rate this is more correct etymologically. As may have been anticipated, the question of the diet and nutrition of the infant engages the author's most serious attention. This section on infant feeding will repay the most attentive study, for this is a subject which the family practitioner ought to wholly assimilate. Its purely scientific side is well illustrated by the account given of the system of feeding regulated by the caloric requirements of an infant. Although the author does not recommend its adoption for practical purposes it is most interesting to note that when worked out it corresponds exactly to what experience has shown to be the proper rations for an infant. Dr. Cautley devotes much attention to proprietary food preparations.

The need of a new systematic treatise on the diseases of children could not be better exemplified than by the section on Disorders of Metabolism, nutrition and growth. Most of the material upon which this section is based is of quite recent development, and the author has thus provided the reader with a comprehensive up-to-date, but carefully selected account of all that is known about such subjects as Acidosis, Recurrent Vomiting, Disorders of Bone Formation, Abnormalities of Growth, and the Pathology of the Thyreid and Adrenal Glands. Though from the point of view of the practitioner this section may deal mainly with the rare and exceptional cases, it embraces, from the scientific standpoint, the most interesting aspect of children's diseases. The specific interest in pediatrics is the study of diseases engendered by a disturbance in orderly and normal evolution, whereas in adults it is the process of degeneration, premature or natural, which is the main object of attention. As the growth of the nervous system is the predominant and distinguishing feature in the development of a child, the disease which may attend this process claims special consideration, and the value of a text book on children's diseases may well be appraised by the ability with which the nervous diseases are dealt with.

The author, referring to the society for the study of diseases of children formed in 1900 and later amalgamated with the Royal Society of Medicine, says: "In 1904 the late George Carpenter founded the British Journal of Diseases of Children, which stimulated anew the study of Diseases of early life." It will be remembered that Dr. Carpenter was editor of this journal from 1896 to 1904 and his teachings are appreciated in this country, as well as in England. We are pleased that the author of this volume refers so kindly to the work which the lamented Carpenter left behind. The author presents a detailed, yet succinct reflection of the present status of Pediatric knowledge which is not surpassed by any treatise on the subject and offers the well informed man a repertoire of the science and art of Pediatry. The publishers realize the great value of the volume and give to it all the art in book-making for which their house is justly famous.

Gynecological Diagnosis, by Walter L. Burrage, A. M., M. D., (Harv.) Fellow of the American Gynecological Society; Member of the Obstetrical Society of Boston; consulting Gynecologist to St. Elizabeth's Hospital; Formerly visiting Gynecologist to St. Elizabeth's and the Carney Hospitals; Electro-Therapeutist and surgeon to out-patients, Free Hospital for Women; Clinical Instructor in Gynecology; Harvard University, and Instructor in Operative Gynecology in the Boston Polyclinic. With two hundred and seven text illustrations. Six hundred and twenty-five pages, cloth binding, $6.00, half leather $7.00. New York and London, D. Appleton and Company, 1910.

This volume is written especially for the guidance of the general practitioner in making diagnosis in cases of uterine disease. The special features of this work are the simplicity of technique and conciseness of essentials from a diagnostic point of view. Photographs of the positions used in the examination taken from the actual patients ready for examination, are reproduced in the cuts which accompany the text descriptive of these procedures. The alphabetical arrangement of the index to illustrations is a leading feature of the work. Thus the reader can find any desired illustration without laboriously hunting through the entire list of illustrations. Each chapter is headed by a summary of contents with page references, and any reference to the contents of this chapter, treated elsewhere in the book is accompanied by a reference, greatly facilitating the value of the book when one is in a hurry. The book is written from a clinical point of view and the reader is not burdened with bacteriology and anatomy but sufficient of the salient points of both are included at the beginning of each chapter and the latest views of pathology are summerized for the reader's benefit.

The symptoms for uterine diseases receive most careful attention and the chapter on diseases of pregnancy, both normal and abnormal are very full and explicit. A special chapter on extra-uterine pregnancy is an extremely important one for the practitioner, since mistakes are liable to be made in the early recogniton of this condition. The ground is most thoroughly covered and the subject presented in all its practical phases. Other special features of this work are the explanation of the anatomy and mechanics of malposition and the mechanism of their production and the diagnosis of injuries of the pelvic floor and perineum, including the diagnosis and laceration of the cervix are all well written and most carefully presented. The chapter on ovarian diseases is likewise very full and concise. The development of ovarian tumors is carefully traced and the differential diagnosis treated at length. Diseases of the rectum and bladder are treated in separate chapters, and the relation of these diseases to uterine diseases is most carefully pointed out. The chapter on diseases of the breast is an exhaustive clinical analysis of the diagnosis of tumors in this region and their differentiation is traced according to history, the patient's age, the situation, duration, mobility and characteristics of the tumor.

Chapter XXVIII entitled "Diagnosis of the Gynecological Affections of Infancy and Childhood," is a chapter of extreme interest to the pediatrist and general practitioner who is called upon to treat gynecological affections of very young girls. This chapter on page 555 is of unusual interest and its careful study will be to the edification of the pediatrician, and general practitioner as well, because it calls attention to the different affections of the uterine organs that have been found in children in recent years, by the pediatrists, and tells how to discover them and of what importance they are and the method and caring for these little sufferers. This chapter alone is worth the price of the book. The closing chapter of the work is devoted to the menopause and presents the latest views of this important subject which should have the most careful attention of every thoughtful physician. The average age at which this "change of life" is established is discussed in a light of the latest information on the subject. The symptoms attending the influence of uterine diseases upon it and its many aspects receive adequate attention.

This is a book which every general practitioner should have and every pediatrist should not only have it in his library but be thoroughly acquainted with its teachings. It gives us pleasure to commend this work and we bespeak for it a favorable reception at the hands of both pediatrists and general practitioners.

Studies of the Human Form. By R. W. Shufeldt, M. D., Major and Surgeon, United States Army (retired); Member of the Zool. Soc. of Phila.; The Linnaean Soc. N. Y.; L'Alliance Scientifique Univer. de France. Author of "Lectures on Biology," "The Negro: a Menace to American Civilization," etc. Imperial Octavo volume of nearly 700 pages with 428 photographic reproductions of beautiful figures. Elegant three-quarter Morocco binding. The F. A. Davis Company, 1914-16 Cherry Street, Philadelphia, Pa.

When a reviewer can fall into a luxurious Turkish rocker, and enjoy a good Havanna while examining a new book, he can revel in its merits and appreciate its good points and after all there are no books which give a reviewer more pleasure to write about than one he has not been hurried in reviewing, but which he has leisurely read page by page—taking in the illustrations as they come. Such a one is the book before us—which we are now tardily reviewing. This is a book we take pride in exhibiting to our friends—all of whom agree that Doctor Shuffeldt had an eye for the beautiful. Perhaps our admiration for and appreciation of this most magnificent work, may spoil our influence as a critic, but nevertheless it cannot deter us from telling our readers that they will search the world over without finding its equal, in any language, as it is in a class all to itself.

On account of its character—this work is sold only to Artists, Sculptors Anatomists and the Medical profession, at the same time it will be of great value for the scientist in any of the learned professions. This is a work of considerable magnitude comprising the most complete and exhaustive study of the nude figure ever published in the English or any language. Doctor Shuffeldt spent many years on its production and has gathered together much valuable information on the subject, detailing many of his trials in securing good pictures—which compare the entire morphological character of the various types and races of people.

The following synopsis will give the reader some idea of the nature and scope of this stupendous work—which include the following, Studies of the Human Form in History; On the value of the study to artists and artisans in general; The human form in bas reliefs; Sculpture and the study of the human form; Anthropology and the study of the human form; Comparative study of the human form; Studies in the savage form; The study as applied to children; The form in the young; Difficulties of studying the human form by the aid of the Camera; The beauties of the form in the female; Further features of the form in females; On the study of the breasts; A brief consideration of the human arm and hand; Hirsute growths and their consideration in art; Waists, normal and abnormal; Art and the human genitalia; the gleuteal region; Studies of the lower extremity; The feet, ears, eyes, facial characters and expressions in general.

The publishers, recognizing the great value and worth of this work have given it all the art in book-making for which they are justly famous. Expense was not considered in the manufacture of this elegant volume and no pains have been spared in its make up, the type, paper, printing and binding are examples of the best that art and skill can produce. It is a credit, alike to the author, the publisher and the reviewer wishes for both every success for their well earned co-laboration.

Hookworm Disease. Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis, and Treatment. By George Dock, A. M., M. D., Professor of the Theory and Practice of Medicine, Medical Department Tulane University of Louisiana, New Orleans and Charles C. Bass, M. D., Instructor of Clinical Medicine, Medical Department Tulane University of Louisiana, New Orleans. 250 pages, royal octavo. Fifty illustrations, including one colored plate. Price $2.50. C. V. Mosby Company, St. Louis, Publishers.

We have anxiously awaited the appearance of this work on ankylostomiasis. For the past ten years or more, considerable attention has been directed to "Hookworm" disease, especially in the Southern States. Where it exerts its ravages upon all ages irrespective of color, and few diseases surpass uncinariasis in the strangeness of its history, the importance of its ravages, or the theoretic ease of its extinction. The authors, realizing the magnitude of its spread, and the economic importance of the disease upon the body politic have produced a volume devoted to the study and eradication of this formidable parasitic disease. The opening chapters satisfactorily define the malady, give its historical and pathological importance, followed by its geographical distribution, zoological features, modes of infection, symptomatology diagnosis, prognosis, prophylaxis and treatment.

It is interesting to note that while this disease has been under investigation in Italy for more than fifty years, during which time many important investigations in diagnosis, history and treatment were carried out, it remained for Americans to thoroughly study the disease and successfully outline its treatment. No more striking example of the transitory state of medical knowledge can be advanced than the proof brought within the last few years, not only that hookworms exist as human parasites in a large part of the country, but that they may with reason be looked upon as among the most important causes of diseases of the South in extent, in destruction of life, and in leading to physical and mental degeneration.

The study of hookworm disease in America has shown the heavy load that endemic disease lays upon a country. Largely due to it, a region that should be most fertile lies relatively uncultivated; a population derived from the best colonizing blood ekes out a miserable existence, and is doomed to extinction unless it is soon relieved of its infection. Thanks to the painstaking labors of zoologists and physicians, much has been learned of the disease and its parasite. Physicians and hygienists have realized that the evil, preventable as it is, must stop, and medical men, administrative officers, and private philanthropists are now working actively to that end.

This volume contains all that is known about "Hookworm" today, and physicians will find this work a valuable and trustworthy guide in the treatment and prevention of dreadful disease. Hygienists will also find much information of practical value. The authors have avoided bibliographical reference as far as possible, but special reference has been made to the researches of Drs. C. W. Stiles, Allan J. Smith, Claude A. Smith and H. F. Harris whose work they have drawn upon when and wherever necessary. This is a book that should be in the possession of and read by every southern physician, and he should accept the teachings and suggestions contained therein. By so doing the disease would soon be wiped out of existence.

The Diseases of Children. By James Frederic Goodhart, M. D., L. L. D. Aberd., F. R. C. P. Consulting physician to the Evelina Hospital for sick children. Consulting physician to Guy's Hospital. Late demonstrator of morbid anatomy and Lecturer on Pathology in its Medical School. Edited by George Frederic Still, M. A., M. D., F. R. C. P. Professor of Diseases of Children, King's College, London. Physician for Diseases of Children, King's College Hospital. Physician to out-patients, the Hospital for Sick Children, Great Ormond Street. Ninth Edition, cloth 909 pages, illustrated, $5.00 net. Philadelphia, P. Blakiston's Son and Co., 1012 Walnut Street, 1910.

When a work has successfully passed through nine editions, it can be accepted with some degree of confidence. The call for this edition bespeaks its popularity and reflects the esteem with which the author and edition are held as teachers of diseases of children.

The author, conscious of a need for a handy authoritative manuel for medical students has prepared a book to fill the gap between the "Student's guides" and the more voluminous text books on the subject of Pediatrics. This is a most excellent hand book for the instruction and guidance of the medical student and young practitioner. Clear, concise, accurate, conservative and resourceful, it commends itself to the review as one of the very best manuals it has ever been his fortune to examine. Without any prominent use of the first person, singular, it indicates close individual knowledge of the subject of Pediatry, expressed in language so plain as to prevent any misconception.

The subjects are conveniently arranged in 59 chapters, encroaching the whole field of Pediatrics in a most satisfactory manner. Sufficient space is devoted to pathology and etiology before leading up to a full consideration of the more directly practical subjects, diagnosis, including diferentiation and treatment. Four chapters are devoted to infant feeding, which is one of the most important subjects that the young physician has to cope with. The work contains seven chapters devoted to diseases of the respiratory system, in which the physical signs are pointed out in great detail, so also in the chapter on heart diseases the authors realize that no consecutive account of such general symptoms are as common to all ages of life. The work closes with a valuable formulary and a fairly voluminous index. It is a pleasure to recommend the work to medical students, medical schools and to the beginner in medicine.

Genesis. A manual for the instruction of children in matters sexual, for the use of parents, teachers, physicians and ministers, by B. S. Talmey, M. D., Former Pathologist to the Mother's and Babies' Hospital and Gynecologist to the Yorkville Hospital, New York. With nineteen cuts and forty-seven drawings, in the text. Price $1.50. The Practitioners' Publishing Co., New York, 12 W. 123rd Street.

We take pleasure in announcing the appearance of "Genesis", by the well-known author of "Woman", this little volume is a manual for the instruction of children in matters sexual. Many parents are convinced of the necessity of enlightening their children in regard to the science of sex, but they lack the requisite knowledge. Even the teachers need a guide to follow. The physician knows his anatomy and physiology, but is generally deficient in pedagogy, while the minister may have pedagogical knowledge yet has little acquaintance with physiology and anatomy. Thus all the four instructors of youth need a manual to guide them in their task.

For this reason the author has set out to supply the want by writing a text book for the instruction of children in matters of sex. In the first, the general part, the author contributes his mite to prove the necessity of instructing the young in sex matters. This section is naturally more or less a repetition of what other authors have said on this subject. The five lessons in the second, the special part, will be of some service to all classes of instructors. The first two lessons are, in the nature of things, only for parents and guardians of infancy and early youth. The two following lessons may be made use of by the cultured parents, but they were written mostly as a guide for teachers. The fifth lesson will be of value to the physician, in his talks to growing boys and girls when going out into the world, and to the minister while preparing children for confirmation.

PEDIATRICS

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EDITORIAL

THE IMPORTANCE OF PEDIATRICS IN THE COLLEGE CURRICULUM.

From an examination of Bulletin number four, from the Carnegie Foundation for the Advancement of Medical Education in the United States, one is suprised and alarmed that so few medical schools recognize the importance for an *independent department of Pediatrics* to the regular college curriculum. Numbers of medical schools grant diplomas to men to practice medicine who have had no special training in diseases of infancy and childhood, and who are not required to pass an examination on this all important subject. It is only in the recent past that the first-class medical schools have taken serious thought of the importance and necessity for teaching diseases of infancy and childhood. When graduates in Medicine have no training in Pediatrics, is it any wonder that infant mortality is what it is? Can you question, that we do not possess the knowledge of properly caring for infants, and treating scientifically the disorders of childhood when the alarming statistics show that about 20 per cent. of all infants born, die during the first year of life, and that 50 per cent. pass over the great divide before the fifth year is reached. If physicians are not well trained in this branch what can be expected of mothers and nurses? The greatest need is better and more generally diffused knowledge regarding infant feeding and hygiene. Proper housing is a large preventive factor, of course. The diseases which we must learn better to control and prevent include acute poliomyelitis, acute gastroenteritis, marasmus, inanition, tuberculosis, whooping cough, measles, diphtheria scarlatina and acute affections of the respiratory tract.

The importance of Pediatrics as a study in our medical schools and recognition of the surgical diseases of children as a department of study was among the admirable features of the report on curriculum presented at the meeting of the Association of American Medical Colleges, held in Baltimore in March. The report placed the minimum number of hours to be devoted to pediatrics at 150, which is an increase of 50 per cent. Even the present requirement of the Association, and yet it is a very modest share of the 4000 hours of the clinical years (the third and fourth years) of the college course. Dr. H. D. Arnold of Boston was chairman of the sub-committee on curriculum for the clinical years and Dr. S. W. Kelley, of Cleveland, member representing pediatrics. The report goes on to say, "The allowance for pediatrics is intended to include instructions in the exanthemata. In many other ways medicine and pediatrics overlap. Unless repetition can only be avoided by a proper understanding between the teachers of these two subjects, and a certain elasticity should be allowed a school for the purpose of assigning time to one subject as to the other according to where the borderland subjects can best be taught. In the same way pediatrics and surgery touch and overlap."

INTESTINAL DISTURBANCES IN INFANTS.

Intestinal disorders in infants usually arise from two causes—diet and bacterial infection. The most frequent disorder is dyspepsia produced by the ingestion of more food than the digestive process can take care of, either too large or too frequent feedings. Owing to this disproportion between the amount of food ingested, and the digestive powers, chemical changes take place in the contents of the alimentary canal which becomes pathological and irritates the mucous membrane, producing vomiting and diarrhea.

Besides the obvious prophylaxis of care in apportioning the food, the treatment of this dyspepsia is starvation for twenty-four hours on a weak infusion of Russian tea, sweetened with saccharin instead of sugar. If the symptoms do not yield to this treatment, calomel may be given in doses of one-third to three-quarters gr. at intervals of two hours for three times. Milk diet should not be resumed when the stomach and intestines are emptied but some starchy diet substituted. Soxlet's nutrient sugar, a soluble preparation of malt and dextrin may be used in five per cent. solution for very young infants. For older babies pure oatmeal or cornflour may be used. Within three days the stools should be semi-solid and of a dark brown color, when the milk may be cautiously resumed. If the vomiting and anorexia continue, the motor functions of the stomach should be investigated. The child should be given a meal adjusted to its weight and age, and the evacuation examination for undigested food and free hydrochloric acid. If the stomach is not empty and contains no free hydrochloric acid it should be washed out with a one per cent. solution of Carslbad salts. In obstinate cases pepsin and HCL may be of use, or a mixture of one gram of liq. strychnini, two grams of fluid extract of condurango, and ten grams of tincture of rhubarb, may be given in doses of five drops, fifteen minutes before a feeding, three times a day.

Infantile enteric catarrh generally occurs as a sequel of the dyspepsia, with thin watery stools, very acid, and speedily producing intertrigo. The bad results upon the general health are not slow in appearance, and wasting sets in. The respiration is deep, difficult and frequently sighing, the pulse irregular and small. Vigorous children often exhibit a high fever, which may be lacking in those of the weaker constitution. The great danger to life in this condition is in collapse, and the best means to combat such a tendency is the hypodermic injection of camphor in an initial dose of 0.1 to 0.2 gram, half the dose repeated at two hours intervals. A very little tea may be given by mouth, and the body supplied with water by subcutaneous injections of saline solution, 150 c.cm. twice a day. Cold wet packs may be employed to reduce the fever, and fats should be eliminated from the diet even after the tendency to collapse is overcome. The best food is mother's milk with the fat taken out. If this cannot be had, thin barley water or other similar starchy preparations may be used. In the writer's experience good results have been obtained by giving good full milk warmed to 40 degrees, C. and treated with pepsin, the amount of the latter, however, being double that usually indicated.

HEADACHE IN CHILDREN.

The frequency and significance of headache in very young children is a subject to which adequate importance is, perhaps, seldom attached by the average practitioner. It is often a symptom of organic and functional disease, sometimes of a serious nature. Acute headache with rising temperature is common as a prodromal symptom of the infections of toxic diseases, and its character and concomitants are of diagnostic value.

In tuberculous meningitis, the intensity of the pain is disproportionate to the degree of pyrexia. It is not very intense, but rather constant, and shifting the position of the patient has no effect upon it, but it produces a craving for rest and quiet. An acute headache, accompanied by vomiting, and a slow and irregular pulse is indicative of meningitis.

Chronic headache, on the other hand may result, among other causes, from rapid growth. It is often observed in rapidly growing boys at the age of nine to eleven years, generally occurring in the morning and in a frontal location. Such headaches cease with the period of rapid growth, but may be generally dissipated by rest and tonics, as they are aggravated by overwork. Vague pains in other parts of the body, especially in the knees, are often complained of at the same time, and the children suffering from them are invariably of the nervous type. Occasionally they are found to have epiphysitis or cardiac hypertrophy.

Physical or mental fatigue, carried to excess, will produce headache in children, either those who are exceptionally quick and ambitious and eager to subject themselves to extra strain, or among those who are slow and "backward" to a degree that makes the accomplishing of ordinary tasks a painful effort.

Defective vision, especially errors of refraction, has long been recognized as a prolific source of headache, as are also nasopharyngeal obstruction, otitis and carious teeth. Often headaches may be attributed, with other characteristic symptoms, to anemia, which may, in turn, be due to nephritis following some infectious fever, and quite unsuspected.

Auto-intoxication, arising most frequently in the intestinal tract, will also cause headache in children, and may be traced not only to disease, but quite as frequently to parasites or to simple constipation. In such headaches regulation of the diet and bowels is indicated. More rarely external causes of intoxication can be discovered, in the shape of drugs or lead poisoning or carbonic acid gas.

Periodical attacks of headache, unaccompanied by fever, are observed in malaria. A chill and an enlarged spleen may accompany this headache, which is of a neuralgic character and generally supraorbital in location.

Hemicrania is fairly frequent in young children, and often found associated with other rheumatic manifestations. Organic cerebral lesions, cerebral tumors and syphilis have a bearing on the symptoms of headache and we should not neglect to minimize the importance of any headache occurring in a child.

DANGERS FROM MILK ON THE POINT OF SOURING.

Sour milk or milk on the point of souring is liable to produce gastric and intestinal catarrhs of acute or chronic character; as an example we have cholera infantum. The causes of souring are lack of cleanliness and high temperature. Milk is unfit for food that contains over 50,000 bacteria per cc.m. However, as the number of bacteria can be reduced to from 4,000 to 6,000 per cc.m. with care the above figure would seem, in our opinion, to be far too large to willingly put up with.

Milk may be unfit for use and cause sickness because the animals are improperly fed or are being treated with the various potent therapeutic agents which are eliminated through the mammary gland. Symptoms of poisoning from arsenic, copper, iodin, lead, mercury, tartar emetic, atropine, colchicum, croton oil, strychnine, veratrum, viride, etc., have been observed.

Milk may be the product of a diseased animal. Local diseases of the udder, as garget, which causes pseudo-diphtheria. as well as general diseases may be thus conveyed to the consumer. Among general diseases are "septic fevers, foot-and-mouth disease, cowpox, anthrax, pleuro-pneumonia, rabies and tetanus, hook-worm," etc.

Tuberculosis may be frequently acquired from milk.

Last, but by no means least important, milk may acquire specific infective properties after it leaves the udder of the animal. Epidemics of typhoid, scarlet fever and diphtheria are known, to be tracable to the milk supply.

To the above headings might be added sophistication with chemicals; those most used at the present time are borax, boracic acid and formalin. We do not believe that there is a drop of pure *fresh* milk sold in any of the larger cities. In many instances it is two to four days old when delivered.

GOAT'S MILK FOR INFANT FEEDING.

The rapid increase of tuberculosis in infants, or rather that this condition is now more often diagnosed, reminds us that Professor Behring insists that "all tuberculosis originates from milk feeding in children." He has not hesitated to declare that even the phthisis of young adults "is only the last verse of the song that was sung to them in their milk-feeding days as infants." Be this as it may, we all realize the fact that notwithstanding the great improvement in the character of the milk supplied to us, tuberculosis among cattle has not been wholly eradicated. But recently the herd of cows supplied milk for one of the largest infant institutions in New York City, was found to contain many tuberculous cows.

In view of this, as well as of the increased cost of furnishing clean milk, the United States Department of Agriculture has been led to investigate the goat as a source of milk supply for children.

The goat in this country is practically clean from tuberculosis, which would make its milk of great value as a food to all children, but especially to those infants of tuberculous parents, not yet infected.

A goat will produce nearly 1,000 lbs. of milk a year of a food value much greater than that of cow's milk.

Its composition is: Fat, 4.30 per cent.; Sugar, 4.00 per cent.; Proteids, 4.70 per cent.; Mineral Water, 0.60 per cent. Total Solids, 13.50 per cent.

It is claimed that by proper feeding the curd of goat's milk may be rendered less solid than that of cow's milk, and the amount of fat and proteids easily diminished.

The goat has been used for hundreds of years in the older countries as a source of milk supply and the government feels that with knowledge will come an increase in its use.

SPECIAL NEED OF WARMTH IN INFANCY.

Before crossing the imaginary line between physiology and pathology, we may touch upon a matter of ancient experience which has received modern illustration; that is the special need of warmth in infancy. The old story of John Hunter and the bookseller is probably old, but it will bear repetition. The bookseller had had five children, all of whom had died under his attempts to harden them. A sixth being expected, John Hunter dropped into the bookseller's and bluntly asked him whether he intended to kill this as he had killed all the rest? The bookseller asked Hunter what he meant, whereupon he took up the parable of the hen and chickens, dwelt on the temperature in whichthe latter lived, and the need of warmth in young animals. The bookseller was convinced, and the infant, which arrived in due course, was saved. Now, you know that babies are not like steel blades—cold does not harden them but the reverse—and we make literal use of Hunter's parable by the employment of the incubator.

With the call for frequent nourishment in childhood is a corresponding liability to rapid exhaustion from discharge. The apparently disproportionate prostration from loss of blood is one of the peculiarities of infancy, and the quickly fatal effect of diarrhea is sometimes painfully noticeable. Common as diarrhea is among infants it can never be regarded without some anxiety. One of the most painful experiences of medical life is the rapid and unexpected collapse which occasionally takes place from this cause—and that, possibly, when the escape per anum has ceased, and to the uninstructed eye the attack appears to be coming to an end; and so it may be, but not to the end desired. Relatives and nurse may be deceived, but the physician will find warning in the failure of the pulse and the coldness of the extremities. As another instance of the results of discharge in childhood, though of a more chronic nature, suppuration causes lardaceous disease more rapidly at this time of life than afterwards, which organic consequence is at this time more amenable to treatment.

The cold enema is also a very valuable means of reducing the temperature in fevers of children and in typhoid fever it is an excellent means of stimulating the liver and kidneys, besides cleaning out the colon. The water is introduced through the rectal tube and should be injected slowly, the reservoir being about one foot above the patient's pelvis; it should be retained 10 to 20 minutes and then slowly let out through the tube and another quantity of cold water run in. This procedure is repeated two or three times without withdrawing the tube. It is well in some cases to begin the treatment with the first half pint of the enema at 90° F. and then steadily but rapidly, reduce the temperature of the rest to 70° F. This helps the bowel to tolerate the enema and prevents its premature expulsion.

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ORIGINAL ARTICLES

BANANA FLOUR AS A FOOD FOR INFANTS.

BY

ERIC PRITCHARD, A. M., M. D., Oxon., M. R. C. P., Lon.

Assistant Physician to the Queen's Hospital for Children, Hon. Physician for Infant Consultation at the Marylebone General Dispensary.
London, Eng.

For many years past I have recommended the addition of mashed banana to the milk mixtures of artificially-fed infants; for I have found its anti-scorbutic properties of value in the maintenance of nutrition. More recently I have been making experiments with banana meal made into a gruel, or decoction, as a substitute for the more expensive proprietary Infant Foods. The results so far have proved quite satisfactory. The chief objections to proprietary foods are, firstly that they are expensive, and secondly that they are either employed as substitutes for cow's milk, or added in too large quantities. It is of great importance that infants should be taught early to digest cow's milk, artificial substitutes for cow's milk do not as a rule achieve that end, for they are mostly pre-digested. The digestion of cow's milk is undoubtedly made easier for the infant by the addition of cereal decoctions and solutions of gum or gelatine. The recent studies of Alexander and Bullowa* on the protective action of colloids in milk have afforded a scientific explanation of the empyrical experience that gum, gelatine or cereal gruel added to milk facilitates the digestion of casein.

It is, however, of importance that, if cereal gruels are employed for this purpose, they should not be given in excessive quantities before the infant has developed its power of diastatic digestion. Very thin gruels should be employed at first, and their strength progressively increased; if this precaution is taken the cereal gruel serves the double purpose of promoting the digestion by casein, and of developing the infant's power of diastatic digestion and it may be used as a substitute for sugar. As cereal gruels I have employed barley water, bread, jelly, oatmeal jelly and barley jelly, all these are excellent in their way but the time and trouble required to prepare them deters many a poor mother from using these particular diluents. A decoction of banana gruel can be made more expeditiously owing to the solubility of the major portion of the carbohydrate content. A satisfactory gruel can be made by rubbing up a heaped tablespoonful (1 ounce) of banana flour with a pint of water and then boiling for five minutes. A gruel made in this way has excellent colloidal properties when added to milk in equal quantity; it thickens the milk, prevents the formation of a leathery coagulum of casein and satisfies the appetite of hungry infants more effectually than simple milk dilutions. The decoction made in this way has not an attractive appearance, for it is of a light chocolate color, owing to the presence of a pigment which tenaciously adheres to the starch granules and which cannot be bleached by ordinary means. It has been urged against bananas and banana flour, as food for infants, that the contained fiber has an injurious influence on the delicate mucous membrane of the intestine. I cannot say that my personal experience supports this view. And I prefer the crude flour to the more highly refined preparations which are sold under fancy names and described as banana meal freed from all fibre. The whiteness of these preparations and their general character leads me to suspect that they contain very little of the original banana, and a large proportion of ordinary cereal flour, and in one instance I was able to know that this was the case.

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*Protective Action of Colloids in Milk, Archives, of Pediatrics, Jan., 1910.

The nutritive properties of banana flour are high, as is shown by the following figures, which represent those of an analysis made by Prof. A. H. Church of a sample of banana meal from Jamaica.

Water, 15.5 per cent.
Albuminoids, 2.5 per cent.
Starch, Sugar, Gum, etc., 77.7 per cent.
Oil 1.0
Fibre .7
Ash 2.7

Many analyses give a higher value for the albuminoids; this according to Prof. Church is due to the fact that the whole of the nitrogen present in banana meal does not exist in albuminoid form, but part in the form of amides, and allowance for this has not been made by others who have conducted the analyses.

With the exception of the lower proteid content banana meal compares favorably as a food with most cereal flours. Although occasionally used in the West Indies as an exclusive food for infants, it is obviously highly unsuitable for this purpose, but in the form of a decoction it is an excellent diluent of cow's milk.

The following table shows the comparative analysis of banana flour, a food sold as a specially prepared banana flour, and two other infant's foods in common use:

	Albuminoids	Carbohydrates	Fat	Ash
1 Banana Flour	2.5 to 4.3	77.7	1.0	2.7
2 Patent Banana Food	13.0	67.0	3.0	2.8
3 Prepared Barley	5.13	82.0	0.97	1.93
4 Popular Infant's Food	9.2	81.2	1.0	0.7

At the St. Marylebone General Dispensary I am now serving certain of the mothers who bring their infants to my consultation with small baskets of the crude banana flour with instructions to make a decoction as above described and add it to the milk in appropriate quantities. The results are highly encouraging.

AERATION BY OSMOSIS—A RATIONAL METHOD OF RELIEVING ASPHYXIA IN THE NEWLY BORN INFANT

WILLIAM EDWARD FITCH, M. D.
New York City.

It is an accepted fact, that unless the blood of an asphyxiated infant is rapidly oxygenated, the child must die. It is also a well known fact that in asphyxiated infants the sensorium has become blunted or so deadened as not to respond to the irritation of the atmospheric air, the application of cold water, alcoholic compounds, or other simple methods of inducing respiration; yet foetal life exists and would continue were it not for the fact that the placenta becomes detached thereby, cutting off respiration—or oxygenation of the child's blood through the maternal circulation. If foetal life could be maintained for a short period of time—until the sensorium sufficiently recovers—many little lives could be saved, which will otherwise be needlessly sacrificed. The question arises how is this to be accomplished?

In answering this question, we desire to emphasize a method of relieving asphyxia in new born infants, which is both novel and unique, rational and practical, being based entirely upon chemical and physiological principles, and like many of the valuable discoveries in medicine, the results of chance or accidental observation.

Recently there appeared in the *British Medical Journal* (5–14–'10) an article on "Artificial Respiration in the New born" which greatly interested the writer. The paper in question was a learned disquisition on the subject and attracted some attention, among others, besides myself, to study the article was B. F. Pendred, M. R. C. S., L. R. C. P., who was incited to report a case occurring in his own practice which was published in the *British Medical Journal*, as follows:

"Mrs. T. was delivered of twins, no skilled attendant being present. The first child was separated, cried lustily, and was put on one side, as usual. The second child was born en masse with the placenta, without rupture of the second bag of membranes, there being one placenta with two cords and two separate bags.

"The attendant, thinking the whole mass was after-birth, put it in a slipper-pan and laid it aside. There it remained until the medical attendant arrived, a period of forty-five minutes at least. (This time has been most carefully verified). The child (male) was then removed from the bag, and showed some extremely feeble signs of circulation, Artificial respiration induced natural breathing in about half an hour. The child is now three months old, and has doubled his weight at birth.

"The point of interest in this case is the time during which the infant survived, namely, forty-five minutes. Probably five or ten minutes would generally be considered the limit.

"Dr. Leonard Hill has kindly furnished me with the following facts which bear upon the case: New born kittens and puppies can be recovered by artifical respiration after submersion for as long a period as thirty to forty-five minutes. A curarized dog's heart will beat for forty-five minutes after cessation of artificial respiration. Guthrie has transplanted a dog's heart on to a dog's carcass, stitching artery to artery and vein to vein, and has seen eye reflexes re-established on setting going the cerebral circulation after nearly thirty minutes' interruption.

"My own suggestion in this particular case is that the long survival of the child was due to the fact that by chance the maternal surface of the placenta was exposed to the air as it lay in the pan, and that this afforded an opportunity for a small amount of oyzgen to enter the foetal circulation. In support of this theory I quote the following sentence from an article in the *Encyclopaedia Medica*:

"In the middle of last century it was a common practice to lay the placenta on the child's belly, and last year Stringer recommends the exposure of the placenta to the air as the rational treatment of asphyxia.

"The method of artificial respiration I employed was that of applying the lips to the mouth of the infant, only a handkerchief intervening, and "blowing up" the lungs then compressing the chest with the hand, and so on. No doubt a good deal of inflation of the stomach takes place, but this is easily expelled and serves the useful purpose of clearing the pharynx of mucous, etc.

"When blowing, the operator must be prepared to receive a rather unpleasant mouthful from the infant's nostrils, but after one or two blows the nose should be gently compressed, in order to prevent the air escaping by that route.

"One great advantage of this method is that it can be carried out whilst the infant is immersed in warm water, and another is that the hand grasping the chest can feel a definite and highly satisfactory expansion at each "blow," and one is not left in doubt as to whether air enters or not. Further, there is no fear of injury to the child's shoulder joints or neck muscles by over-vigorous stretching.

"I always employ this method and believe it to be superior to any other. It is so simple, so easily performed, and so obvious that it must be resorted to by many midwives, and I think their experiences would be of great interest."

On closely studying Dr. Pendred's report, above noted, it vividly called to mind the report of a similar case reported before the Florida Medical Association in April, 1897, by Dr. Sheldon Stringer, which we will attempt to relate, so far as our memory will allow, after a lapse of thirteen years.

"Several years ago" he said "I was called to a multipara in fifth month of gestation. In a few hours she was delivered of a foetus, which I took to be about the age of a four and a half or five months. The labor was rapid and uneventful the child-membranes and placenta were all expelled at, by, one and the same, effort without rupture of the membranes. Nothing unusual having occurred, the foetus and envelopes were laid aside until my departure. I asked permission to take it with me as a specimen and wrapped it up in some cloths, and placed it in my buggy. Arriving home late at night, (midsummer) I deposited the package in my office until morning, when I proceeded to examine my specimen, and, to my astonishment, found the foetal circulation still going on, with pulse at wrist very perceptible. This being several hours after birth. Here was a case of feotal circulation carried on by aeration of the blood through the medium of the exposure of the maternal portion of the placenta to the atmospheric air.

"In contemplating this case it occurred to me that this information might be utilized in cases of asphyxia in newly-born infants, and I resolved to try the first case that came under my care.

"Some time elapsed before a case offered to me in practice what I thought to be an important discovery. At last a case presented itself. A large and well developed child, of white parentage, and in which the head had been moulded into cyclindrical form by a narrow pelvis. The child could not be induced, by the usual method of cold application and rolling, to make any effort at respiration though the circulation was still going on in the funis with some vigor.

"The deepening of the dark hue of the surface plainly indicated that, unless oxygenation of the blood could immediately take place, death would soon follow.

"Already the pulsation in the cord had become feeble, and was rapidly becoming more so. I delivered the placenta as quickly as possible, cleansed it of clots, and exposed the maternal surface to the atmospheric air. In a very short time the pulsation was perceptibly increasing in force; the livid and death like hue was being displaced by one of life and health, after which it required but a few moments for the restoration of sensibility, when the process of respiration 'was established.'"

Many years after attending the meeting of the Florida

Medical Association, above mentioned, an occasion presented for the author's testing the Stringer method. I was hurriedly summoned to see a lady taken suddenly in labor, when I arrived at the scene, I was told that "everything had come away nearly an hour ago." On making an examination I found the foetus, placenta and membranes intact, laying on the bed, with the child floating in the amniotic sac.

The mother was very weak and pallid from loss of blood. I at once began kneading the lower abdomen after Crede's method to cause the uterus to contract, ordered ergotale by mouth and hypodermatically. After controlling the post pastum hemorrhage, we turned our attention to the child, which we thought was dead. We ruptured the membranes but respiration could not be induced by the usual methods. The circulation was going on in the cord with some vigor, but the mahogany hue of the surface of the child's body plainly indicated that it was rapidly dying from want of oxygen. I hurriedly turned over the maternal side of the placenta, exposed it to the atmospheric air, cleansed away the clots of blood and dashed a half glass of water on the maternal side. In a very short time the deathlike hue was rapidly replaced by a healthy appearance. A few moments longer sensibility had been restored and the process of respiration began. I firmly believe that had the placenta remained, maternal side on the bed, submerged in blood, a few moments longer, excluded as it was from atmospheric air, that death from asphyxia would have been inevitable.

Observation, in several subsequent cases, has clearly proven to my mind, that this simple, rational method of resuscitation for asphyxia in the newly born is preferable to all others. Is it not a physiological and chemical fact that when blood exposed to the atmospheric air, even in an open vessel becomes rapidly oxygenated? Is it not an easily demonstrated fact that venous blood, when exposed to the atmospheric air becomes reddened in a few moments? Then why not aerate the infant's blood through osmosis, by allowing the atmospheric air to come in contact with the irregular maternal surface of the placenta where aeration has been going on from the earliest moments of the beginning of embryonic life?

The majority of cases of asphyxia follows prolonged or tedious labors, where much time has been required in moulding the head to the narrow pelvic passage, and where the powerful expulsive effort of nature to deliver the child is rapidly followed by strenuous uterine contractions which detach the placenta and throws it into the os, or completely into the vagina as the third stage of labor is completed. In such cases the accoucher should find no difficulty in the immediate delivery of the placenta, where the child be asphyxiated.

In cases with signs of asphyxiation, if the cord is around the neck gently unwind it, at the same time examine it for any interference with free circulation, and correct same, if the placenta should now be spread out with the maternal surface cleansed and exposed, so that free access of air can be afforded. If necessary, on account of numerous, or small clots, to use water it should be warm, as it is remarkable how quickly the use of cold water will chill the child, which is but a natural result when you apply cold to so large a surface of the capillary circulation, as is maintained in the maternal surface of the placenta.

So long as the circulation continues in the cord there need be no fear for the life of the child, for it is a continuation of foetal life, *after birth* and the child may be kept alive for an indefinite time. As soon as respiration begins, which in some instances has been delayed as long as thirty or forty minutes, in some cases, the circulation immediately changes from the placenta to the lungs and pulsation in the cord immediately ceases, when the child may be separated from the placenta as in ordinary cases.

When the cord is tied and cut the umbilical arteries are at once obliterated with the exception of their lower portions which remain as the superior vesical arteries. The unbilical. vein is obliterated and becomes the round ligament of the liver The foramen ovale closes, thereby cutting off communication between the right and left hearts. By the second or third day the ductus arterious has become obliterated, to become later in life the legamentum arteriosum.

These changes in the circulatory apparatus are dependent upon the establishment of pulmonary respiration at birth. The first inspiration is said to be due to a sensory reflex from the cold air striking the sensitive nerve, filaments of the skin of the chest and abdomen. After the cord is tied there soon follows an increase of carbon dioxide in the blood, which stimulates the activities of the respiratory centre in the medulla. However, in cases of asphyxia, the various centres are but feebly irritable and require heroic stimulation to bring out their activities.

Here the exposure of the maternal surface of the placenta to the atmospheric air will by osmosis promptly aerate the blood of the child and relieve the stifling asphyxia.

320 Manhattan Ave.

THE PRECOCIOUS DIAGNOSIS OF MEASLES BY KOPLIK'S SIGN.

Translated from Le Journal de Medicine et de Chirurgie, 14 August, 1909. by

FREDERICK S. MASON, M. D.
New York City.

The value of Koplik's sign from a diagnostic standpoint has been variously interpreted. Certain authors deny its value. It appears that the divergences resulting therefrom in France is because the sign is imperfectly known and has not been properly described. Dr. Bralet just published in the *Gazette Medical de Nantes* an excellent *resume* of the question which we think is interesting to reproduce.

The Koplik sign, says Dr. Bralet, may render the greatest of service when it is better understood, for of all the symptoms which mark the period of the invasion of measles, it is the only one which is pathognomonic. The Koplik sign is the presence of mucous membranes on the cheeks and lips, of red patches, the center of which is occupied by a whitish dot. The sign is rose-colored or clear red, irregular and star-like, sometimes round; at first small, it enlarges and unites with other neighboring spots; the central part, bluish white, is the fundamental element and only pathognomonic sign of Koplik. It is round and of small dimensions and never reaches two to six millimeters in diameter, as it has sometimes been said to measure but is at most one millimeter in diameter or less. This detail is very important to differentiate between Koplik spots and aphthous stomatitis. The bluish white spot's point, come slightly out, adhere to the mucous membrane and can only be removed with difficulty by rubbing with a tongue depresser. The mucous membrane on which the Koplik spots are found often presents a characteristic dull appearance which has been brought forward by Guerin. When the red spots have not begun to fuse together, the mucous membrane is uniform, but the whitish points never unite together. Koplik spots do not ulcerate and appear in from three to five days. Exclusive localization of the Koplik sign is the mucous membrane of the cheeks and lips. It is never seen on the mucous membrane of the gums. The number of spots and the white points is very variable; sometimes only very few, other times very numerous. The means given by the various authors is from six to twenty on the internal surface of each cheek, as given by Bing, it is below the generality.

In order to properly see the Koplik spots, good lighting is indispensable. The patient must be examined in full daylight near a window. The Koplik sign appears generally from one to three days preceeding the eruption, and in the majority of cases, the evening before it and disappears about the second or third day after the appearance of the rash. It is almost always constant. Like all the exanthemes and enanthemes, it may be reduced to a minimum and may only last a very short time, hence it is quite possible for it to escape notice during the period of invasion. The absence of the Koplik sign, is not sufficient evidence to deny the diagnosis of measles.

TIC IN CHILDREN.

Nature and Definition of Tic.

BY

TOM A. WILLIAMS, M. B., C. M., Edin.

Memb. Corresp. Soc., de Neurol. de Paris; Memb, Corresp. Coc. de Psychol. de Paris; Memb. Assoc. Soc. Clin. Med. Ment.; Neurologist to Epiphany Dispensary, Washington, D. C.

"Among the confused varieties of spasm, clonus, hyperkinesis, etc., it is impossible not to recognize the obvious individuality of certain motor affections, certain movements of defence, of expression, of mimicry, certain gestures more or less co-ordinated for some imaginary end, all readily distinguished from spasms, fibrillary contractions, and choreiform or athetotic movements. It is only logical to attribute a somewhat more complex origin to these varying gestures, in which the influence of the will, however unperceived in the end, is always to be detected at the beginning.

"While some convulsions and spasms are the product of special changes in muscle fibre, or motor nerve, or spinal cord, in medulla, pons, or basal nuclei, the synergic and co-ordinated muscular contractions of tic imply cortical intervention. The will may not play a conscious role therein; but the cortex alone is capable of initiating such acts. What part does it take in their genesis?

"For an instance, a simple blinking of the eyelids may form a tic. Considered in itself, it is a movement of defence against dust or light; but in the absence of irritation, it becomes meaningless. How then are we to explain the abruptness and intensity of contraction of the orbicularis palpebarum, and of this muscle alone? If it were due to stimulation at some point on the reflex facial arc, other facial muscles ought to be involved; if referable to isolated excitation of the orbicularis filaments of the facial nerve, why is the contraction bilateral? It is evident we are dealing here not with a simple reflex of bulbar origin, but with a movement at once premeditated and purposive; and it is this purposive element, presupposing, as it does, co-ordination of contraction, that indicates the cortical nature of the phenomenon. Such co-ordinated movements, however causeless and inopportune they may appear, cannot be identified with mere pathological reflexes or spasms. They are tics." —*Brissaud.*

For instance, a speck gets under the eyelids. The ensuing wink is not cortical in origin; but after the irritation has vanished any blinking which persists has been dictated from the cortex, which orders the repetition of the gesture in the absence of peripheral cause. It is the patient's thoughts which determine what has become a purposeless movement. Sometimes the source of this is the desire to verify the absence of irritation, sometimes no clear thought is present beyond a longing to perform the movement. It is an impluse to repeat to excess a once functional act. The imperiousness of this resembles that of the obsessive idea. The failure of the will to conquer the impulsion is a stigma of mental degeneracy. Mental infantilism characterizes the subject of tic; and his will has the capricious and weak nature of the child's.

Not every peculiar habitual movement is a tic however; stereotyped movements can be repressed at the will of their victim without any agony, and they continue and indeed are most marked when attention is concentrated elsewhere; whereas a tic usually disappears when the patient's mind is intently engrossed.

The clear statement from the late Professor Brissaud's preface to the treatise of Meige and Feindil sumarizes a distinction of the greatest importance in the estimation of the myoclonias which are so frequent in childhood.

But even when spasms, chorea and cerebellar tremors are abstracted, the polymorphism of tic is so great as to give rise to confusion unless its mechanism is clearly comprehended. I quote Trousseau's classic description (*Leoons Cliniques*, 1873 Vol. 11).

"Non-dolorous tic consists of abrupt momentary muscular contractions, more or less limited as a general rule, involving preferably the face, but affecting also neck, trunk and limbs. Their exhibition is a matter of every day experience. In one case, it may be a blinking of the eyelids, a spasmodic twitch of cheek, nose or lip; in another, it is a toss of the head, a sudden transient, yet ever-recurring contortion of the neck; in a third, it is a shrug of the shoulders, a convulsion or convulsive movement of diaphragm or abdominal muscles,—in fine, the term embodies an infinite variety of bizarre action that defy analysis no longer.

"These tics are not infrequently associated with a highly characteristic cry or ejaculation—a sort of laryngeal or diaphragmatic chorea—which may of itself constitute the condition; or there may be a more elaborate symptom in the form of a curious impluse to repeat the same word or the same exclamation. Sometimes the patient is driven to utter aloud what he would fain conceal."

To this definition we must now-a-days add the tonic movements of convulsive nature which are produced by a conditioning thought, and which like the clonic tics, are the vestiges of a once purposive act.

Hence we may say that "a tic is a co-ordinated purposive act, provoked in the first instance by some external cause or by an idea; repetition leads to its becoming habitual, and finally to its involuntary reproduction without cause and for no purpose, at the same time as its form, intensity, and frequency are exaggerated; it thus assumes the character of a convulsive movement, inopportune and excessive; its execution is often preceded by an irresistible impluse; its suppression associated with malaise. The effect of distraction or of volitional effort is to diminish its activity; in sleep it disappears. It occurs in predisposed individuals, who usually show other indications of mental instability."—*Meige et Feindel loc cit.*

Pathogenic Varieties of Tic.

II. By this definition, tic is of purely psychic origin. The manner of its production we speak of as the psychological mechanism. On studying this in a larger number of cases, we find at least two principal varieties, which differ in (1) mode of production, (2) mental state of the patient, (3) and method required for successful treatment.

The first of these is *Hysterical Tic*. It is so called because it is produced by suggestion and curable by suggestion—persuasion, in accordance with the definition of Babinski (2) which the writer has discussed at length from various aspects. (3)

This type of case is quite common in children, and is often a development of an imitative grimace. For instance, it is quite frequent that the movements of a choreic child in a school room are consciously imitated by mischievous and mocking comrades. Some children quickly cease making the imitative movements; but in others, the idea of doing so becomes dominant, and they continue the movements in spite of themselves; it has become habitual. Such cases are sometimes mistaken for Sydenham's chorea, and so treated. If the movement is that merely of turning the head, *spasmodic torticollis* may be diagnosed; and this error may lead to an operation, entirely useless except for its suggestive effect, an effect which may be more permanently and securely produced by psychic means; for operation only reinforces the false idea of physical disorder, and prevents proper attention to the real mechanism, which is mental. A case of hysterical torticollis in a boy of eleven was reported by the writer to the Washington Medical Society, Dec., 1908.(4) It is as follows:

Case of Hysterical Tic.

The case was seen by the writer at the George Washington Dispensary in December, 1908, (Dr. Frankland's Service.)

The patient declares that ever since the age of five he has felt the need of periodically turning his head abruptly to the right every few minutes. He experiences no intense desire to do this; but as he never attempts to inhibit the movement, and performs it at least every few minutes, he gives himself no opportunity to develop angoisse. He presents no other neuropathic stigmata, having neither scruple, timidities, aboulia nor feelings of inadequacy, morbid fears, monomanias; although he occasionally *day dreams*; but what boy of his age does not?

The movements are short, but not electric; but they often occur in volley. They are such as could be reproduced volitionally. They are painless; disappear with sleep. However, no conditioning idea could be elicited, as he is entirely unaware how he began the movement, saying: "It just comes." The movements are more numerous when he is perturbed; and have never been influenced by any neutralizing subterfuge, none having been tried. They consist of sudden turning of the chin over the right shoulder, sometimes accompanied by its elevation and that of the shoulder, and a twitching of the face, more especially the lips.

Explanation and Treatment.—So it is very evident that the spinal accessory nerve alone could not cause such a movement; and it is inconceivable that a local irritation could comprise the facial nerve, the spinal accessory and all the nerves of the cervical plexus without having some effect upon contiguous structures and implicating the phrenic nerve as well. It must therefore be cerebral. The question whether focal or psychic is answered by the test of voluntary inhibition of the movements; and I found that by maintaining his attention firmly to follow with his eyes the movements of my slowly moving finger, fixing it intently and vividly, that I was able to entirely suppress the movement, first for a space of thirty seconds and later for periods of increasing duration. I then impressed upon him the power of his will in suppressing the movements, and he was ordered to come to the dispensary every day for treatment, which consisted of the psychomotor discipline of fixing with his eyes slowly—moving and stationary points for longer and longer periods under the supervision of Messrs. Page and Buckner, two of the students in the dispensary. He supplemented this by similar exercises at home; and at the end of ten days, the tic was under such control that he made the movement only twice daily. At the time of writing he is cured, several days passing without tic.

Although I failed to trace the initial idea which lead to the tic, I have little doubt that it was derived from suggestive imitation of some older person; for the boy showed not the least trace of psychasthenic constitution; and there was not the agonizing need for making the movement which such patients always exhibit; besides he was cured much more rapidly than is a psychasthenic. Indeed, psychasthenic manifestations so early in life indicate marked mental degeneracy or very powerful debilitating influences, such as in the case of the child aged two years, I reported to the Archives of Pediatrics, in whom ingestion of coffee since the age of three months has produced a severe psychasthenic syndrome. This boy, on the contrary, although a Russian Jew, and although he had suffered hardships, poverty and had fled from Russia to escape the persecutions, yet was of sturdy stock, of good nutrition and of mental capacity and solidity of character quite extraordinary. So that we are forced to explain the pathology as a habit accidentally acquired during the very impressionable period of early childhood.

Instances might be multiplied; but I feel sure that every pediatrist who carefully reflects will be able to recall many in his own experience.

The *psychasthenic tic* is a much more complex affair; for though its localization may be conditioned by a peripheral irritant such as the friction of a rough collar, an ill-fitting coat or shoe, a tender conjunctiva, an abraded cheek, a jagged tooth, yet it is only patients mentally predisposed who react by a tic. In them, the general state (5) makes imperative the need to tic, which they can only forego by volition with great effort and emotional distress. It is really an impulsion, for which satisfaction can be obtained only when the act is performed or when it is substituted by some other act which satisfies the patient's longing. It is in essence the same psychological state which in the absence of definite localization may lead to the imperious need for narcotics. (6). It is this same state which causes the dromomania of the tramp. In severe cases, an active distress takes the place of the former impulsions. So great may this be that the respiration may be accelerated, the heart may palpitate, cold sweat may flow and the whole picture of what the French call "angoisse" appear. The attempt to arrest a long standing tic may be followed by this state of anguish.

Naturally, the comparative simplicity of the child's mentality should render the source of this tic easier to fathom than is the case in the adult, but the habit of introspection is in most children unfortunately throttled in its incipiency by ignorant parents and an obstacle to psych-analysis is thus presented. Besides it must not be forgotten that a tic movement has originated by purposive and therefore physiological movements; for neither its extension, direction nor character may be in themselves abnormal. Its pathological nature is constituted by its perpetuation into an inappropriate movement which the conviction of its mutility cannot abolish. It has become a forced agitation as Janet (7) has called it, the patient being compelled against his will to tic. A favorite expression of the patient's is, "it is stronger than I."

The pathogenesis, character and mode of treatment of this affection may be best illustrated by an adult case from which the application to children is simple enough. Case of *psychasthenic tic.*

A patient of Meige and Feindel had the habit of holding his left arm half flexed firmly pressed against the body in the position assumed by hemiplegics. The pose, inertia and awkwardness of movement suggested an organic affection corroborated by the patient's exclusive use of the right arm and adoption of devices to spare the left. But in reality he could execute any movement of the left arm with energy and accuracy. He could handle a knife, dress himself and even hold a pen and write with it.

The position was first assumed to alleviate a pain in the shoulder, perhaps imaginary. This sovereign remedy, at first voluntary, became an automatism, although it soon began to fail of its object; and to relieve the discomfort in his shoulder, he had recourse to the procedure of gripping his left hand and pressing it against the epigastrium with his right. Dissatisfied with this, he endeavored to devise a more efficacious arrangement, and his efforts eventuated in a most complex series of passive movements administered to the left hand, wrist, forearm and arm by his right hand. The appearance was that of a pitched battle between the left arm and the right hand, in which victory was always gained by the affected limb, in spite of a real brutality of onslaught and ingenuity of device.

Resignation to this imperious motor obsession gave great relief, and was followed by a sense of well-being. On the other hand, resistance was accompanied by actual anguish; he would fidget desperately in his chair, cross and uncross his legs, sigh, grimace, rub his eyes, bite his lips and nails, twist his mouth about, pull at his hair or his moustache, he would look anxious or alarmed, would become by turns red or pale, and beads of perspiration would gather on his face. At length, he would be compelled to yield; and the bloodless battle of his upper limbs would close more furiously than ever.

In this case the typical features of obsession are excellently illustrated; its irresistibility, as well as the concomitant distress and succeeding content.

I resume in a table (8) the main signs which differentiate tic from movements which should not be so designated and which should be called spasm, (9) chorea (10) and Rubro spinal tremor (11) respectively.

Differential Diagnosis Table.

Spasm	Tic	Chorea	Cerebellar and Cerebello Rubro Spinal Tremor
Sudden, resembling electrical stimulation.	Brusque and brief, slower.	Still slower.	Not sudden but regular and increased by movement.
Rythmic and synchronous or in lightning waves of same movement.	In volleys of similar movement repeatedly.	Irregular, not synchronous.	
	When tonic, distinguished from sterotyped act by absence of catatonic attitude:	Extreme variability in movement with tendency to unilaterality.	Similar oscillations.
Muscle often enfeebled.	No weakness, often hyperkinetic hypertrophy.	Myasthenia, hypotonia.	Myasthenia, hypotonia, or the reverse.
Exaggeration of reflexes concerned only.	Reflexes normal.	Reflexes often modified.	Reflexes increased.
Distribution of peripheral nerve.	Locally conditioned by an idea.	Laterality.	Laterality or not.
Often painful, always distressing, no craving.	Painless.	Sometines painful.	Never painful.
Persisting in and may interrupt, sleep.	Tic disappears in sleep.	Sleep interfered with.	Disappears in sleep.
Purposeless.	Pseudo co-ordinate, intentional act	Purposeless.	Purposeless.
Irreproducable voluntarily, unmodified by volition or emotion.	Influenced by emotion or volition, but impulsive and followed by satisfaction, always arrestable (leaving no trace) by a subterfuge, a neutralizing act, inefficacious mechanically or physically, but effective psychically; also variously by solitude distraction, position, etc.	Uncontrollable by will, aggravated by emotion.	Cease at rest.
Various etiology, but generally peripheral irritation, e. g., trigeminal neuralgia (which is not a true tic).	Psychasthenic character. Similar heridity, but always first generated by a determining stimulus; it is the sequel to the unhindered repetition of a once voluntary purposive act, becoming an impulsive obsession.	Acute rheumatic diathesis, probably bacterial. No similar heredity.	Various, neoplasm.

A careful study of a few cases in the light of these facts will be found of more service than pages of further description.

I repeat that as a guide to treatment, the form of the movement is of far less importance than its manner of genesis; and it is in that respect that a tic shows characters so distinctive as to place it in a nosological category quite apart from any other affection of myoclonic or myotonic type. For although scriveners palsy and other professional cramps may be placed in a class apart, they are in psychological mechanism essentially tics, as some of Meige's cases indicate, and as I shall still more clearly show, in a future paper, by some remarkable cases. The rythmic movements seen in infants and imbeciles are biologically similar in mechanism, although they have not the richness of psychological mechanism revealed by analysis of most cases of tic. The importance of these distinctions as guides to treatment cannot be over estimated; but space forbids their development here. (12) Enough will here be gathered en passant from the cases cited to indicate the principles involved.

Treatment.—The treatment of tic is largely therefore pedagogical or more strictly speaking psycho-orthopedic. The removal of the tic itself accomplished by very short exercises of stabilization and ordered mobilization to be gradually lengthened as the patient gains control.

The treatment of the mental state from which proceeds the disposition to tic is perhaps even more necessary in many cases. This consists of the psychoprohylactic ordering of the patient's thought and habits (13) from the point of view that he is improperly balanced psychologically. The adjustment of the patient involves attention to matters of bodily hygiene as well as discipline of his mind and emotional interests. It cannot be left to laymen, and requires at first very frequent and assiduous co-operation by a medical man skilled in the interpretation and correction of the difficulties of these patients. When this is secured, tic is not prognostically unfavorable as was formerly supposed.

1758 K. St.

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ACUTE INFECTIOUS DISEASES AS THE CAUSE OF HEMIPLEGIA IN CHILDREN.[*]

BY

MARY M. S. JOHNSTONE, A. B., M. D.
Chicago, Ill.

The etiology of hemiplegia in children is a problem not as yet completely solved. Three groups are recognized:—Cases which develop before birth, and are due to some psychical condition of the mother, as fright, to some injury, or some acute illness of the mother, or distress during pregnancy. Cases which develop at birth, and are due to a protracted or difficult labor, especially a foreceps delivery. Cases which develop after birth, and are due to trauma, fright, or one of the acute infectious diseases.

Although convulsions and epileptic attacks, through injuries to the blood vessels, were long known to be responsible for some cases of hemiplegia in children, yet the etiology of the greater part of these cases was still problematic, until Strumpell, in 1884, showed that:—"Cerebral palsies of children depend upon inflammation of the gray substance of the motor cortex. There is, therefore, an acute polioencephalitis analogous to acute poliomyelitis. Both depend upon the same infection which sometimes becomes localized in the brain, sometimes in the cord."

It is now known that one third of all cases of spastic hemiplegia in children are due to some acute infectious disease, although the disease may be unrecognized, or unknown.

Also, there is not a single infectious disease which has not been found to be responsible for hemiplegia in children. Freud gives the following list:—measles, scarlet fever, diphtheria, whooping cough, vaccinia, typhoid fever, meningitis, mumps, rotheln, tonsilitis, dysentery, pneumonia, malaria, chorea with endocarditis and influenza. Congenital syphilis is now considered to be only a predisposing factor in these cases.

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[*] Read before the Chicago Pediatric Society, May, 1910:

Despite the great amount of work that has been done, the origin of many of these cases is obscure. In regard to the occurrence of hemiplegia in children, three-fifths of all cases develop in the first two years; and three-fourths during the first three years; and seven-eighths during the first five years of life, while the majority occur in the second year. These cases are rarely seen after the ninth year. The right side is involved more often than the left side.

As a rule, the onset is sudden and severe. The disease is ushered in with one or more convulsions, coma usually follows, and it may last from a few hours to as many days. Fever, nausea and vomiting are present. At times the patient has attacks of screaming. Sometimes the initial convulsion is absent, and again the trouble comes on insidiously without any symptoms. The paralysis may disappear when the patient recovers from the acute infection, it may last a few weeks, or remain permanently.

In these cases the paralysis is at first flacid, but shortly becomes spastic. Aphasia, if present, soon disappears. Eventually one finds a typical spastic hemiplegia, the characteristic position of the paralyzed limbs, the characteristic gait, slight atrophy of the muscles on the affected side, contractions, increased reflexes, normal sensations, and pain, but there is no reaction of degeneration, as seen in hemiplegia in adults.

If hemianaesthesia is present, it points to a basic lesion in the region of the optic thalamus (*Osler*, *Prac. of Med.* 1909). Three forms of spontaneous movement may be found, tremor, choreiform movements and athetosis. Usually there is some form of mental deterioration, as imbecility, or idiocy, or impaired mental development.

One of the most serious results is epilepsy. It has been reported in from 13.7 per cent. to 66 per cent. of the cases. Although the usual interval is one or two years, it has been found to begin anywhere from a few weeks to ten years after the onset of the hemiplegia. It may occur as petit mal, Jacksonian epilepsy, or convlusions.

Turning now to the pathological changes which are present in the brain in spastic hemiplegia of children, it is now believed that there is an encephalitis present in the majority of cases. There are foci of swelling and softening, with local necrosis, or scar tissue and possibly atrophy.

The lesion in the brain may be due directly to the acute infection or to the toxin formed, sometimes both the acute infection and the toxin may be responsible.

Batten speaks of (1) Acute polioencephalitis, superior in which the occipital lobes are affected, (2) Acute polioencephalitis inferior, which involves the nuclei of the cranial nerves; and (3) Acute poliomyelitis anterior, affecting the grey matter of the anterior horns in the cord. There may also be a polioencephalomyelitis.

In not all cases of acute infectious diseases, is there an encephalitis. Hemorrhage into the brain has been found in several cases of whooping cough and of diphtheria. Emboli have been present in cases of scarlet fever and diphtheria. Whenever there is a vascular lesion as a hemorrhage, an embolus, or a thrombus, the final result is sclerosis, or porencephalus.

It is impossible to decide from the clinical symptoms what lesions may be present in the brain. It has been my privilege to study two cases of hemiplegia in children. One developed in the course of a general pneumococcus infection, the other came on during an attack of erysipelas.

The first case was a little girl of eight years. The history was, she had been vomiting for 24 hours, and on the second day previous to my first visit, she had not eaten any dinner. The physical examination was negative. The temperature was 101.8 degrees, the pulse 112. One grain of calomel was given.

On the following day, the vomiting had stopped, but now the child seemed stuperous, at times she was restless. The temperature 102 degrees, pulse 120, and respirations 28. There was some cough, the lungs were full of rales, and there was a slight paresis of the left arm and leg. The throat was red: During my morning visit, I noticed the left pupil contract the eyes turn to the right, and a stare come over the face, then a slight rigidity of the body, but all this passed off instantly. In the afternoon, percussion along the cord showed marked tenderness and there was some dullness in the left lower lobe of the lungs.

At about 9 P. M. that same day, a strange look came over the child's face, she choked, turned blue, became rigid, then worked all over. Stringy mucous came from her mouth. These convulsions lasted two hours, yielding only to chloroform inhalations, but after the severe convulsions involving the whole body ceased, a clonic spasm remained in the left foot, necessitating the constant use of chloroform for three hours longer.

From 9 P. M., May 24, the time of the first severe convulsion, until midnight of May 26, the child had five of these attacks, each one of which lasted five or six hours. From the first convulsion, until the last, was a period of 72 hours.

In the second severe convulsive attack, only the left arm and hand were involved; in the third there was some movement of the right arm, as well as the left arm.

During the fourth seizure, the left arm was in constant motion, even when the child was snoring under chloroform, the left side of the face was involved. In the fifth attack, the left side of the face worked, even under deep chloroform narcosis, the convulsions extended to the right side of the face and the muscles of the neck. Owing to the interference with respiration, it seemed as if each convulsion would end the scene. On the 27th, at 9 P. M. there was a momentary convulsion in the left hand and the left side of the face. During the seizures, the pupils were pin-point, the eyes turned to the right, the expression vacant and staring. Twice the patient assumed the position of opisthotonos.

On the sixth day (counting the day on which the patient refused to eat, as the first day), the temperature was 99 degrees, the pulse 88, and the respiration 20. On the morning of the eighth day, the patient was stuperous, she seemed to be much worse. This collapse marked the end of the crisis, and from there on the patient made a rapid recovery.

During the period of the convulsions there was a paralysis of the left side, but fortunately this paralysis lasted only until the crisis. When first allowed to walk, the child dragged her left foot, but this last trace of the paralysis quickly disappeared. During the pneumonia there was a semi-delirium.

The pneumococcus was found in pure culture in the stringy mucous from the throat present during the convulsions.

To sum up, this was a case of general infection due to the pneumococcus, the throat, lungs and meninges of the brain and cord were involved, there was severe vomiting at the onset, convulsions, semi-delirium, and paralysis completed the picture.

The crisis came on the eighth day. Recovery was rapid and complete. Today, five years later, this patient is perfectly well, and without a trace of this illness.

The patient in the second case is the reverse.

This patient, when seven years old, had an attack of erysipelas which began as a pustule on her right ankle, the inflammation spread until the whole right leg was swollen. Convulsions came on, in which the right side worked, this was followed by a stupor which lasted several days. The patient was in bed three months. On recovery from the acute infection, there was a spastic hemiplegia of the right side.

The conditions today, forty years after the acute infection, is typical, the position of the arm and leg, and the gait is characteristic of spastic hemiplegia, there is slight atrophy of the muscles on the paralyzed side, general increase of reflexes more marked on the paralyzed side, pain on the lame side and numbness in the well hand and arm. Pain, and temperature sensations are absent, touch is recognized only as a "numb feeling" on the lame side. On the paralyzed side the skin is shiny, bluish and cold to the touch. Contractions, choreiform movements and athetosis are present. Regularly every two weeks, she has had sinking spells, in which she looks as if about to faint away. All these symptoms date from the attack of erysipelas. For one year, the patient has had, at intervals of from four to six weeks, epileptic attacks, in which she has lain in an unconscious state from one to four hours. She is now in the menopause.

Headache is present the greater part of the time, one spot, the size of a dime, on the left side of the head, near the median line, is very tender, pressure on this spot gives relief from pain. Mentality is but slightly impaired. There is a loud, blowing, systolic murmur at the apex of the heart. The condition here is probably due to an encephalitis, the result of the erysipelas.

Although it is known that paralysis may follow erysipelas, in looking through the literature I have not found any such case recorded, nor do any of the authors include erysipelas among the acute infectious diseases which have been known to give rise to spastic hemiplegia in childhood.

INFECTIOUS ARTHRITIS.*

With Report of Clinical Cases.

BY

D. T. BOWDEN, M. D.
Patterson, N. J.

In offering this subject for your consideration I do so with the object of presenting one that will be of general practical interest rather than a purely special orthopedic subject. Viewing the subject broadly, one may, according to the usual diagnosis made, say that it covers all joint inflammations that are diagnosed as rheumatic excepting possibly those of traumatic origin.

The scope of this paper will not permit of taking up each subject according to the extensive classification which is based upon the organism causing the infection and as the principles underlying all these conditions are the same, simply differing in severity according to the kind of infection and susceptibility of the individual, the writer will consider the subject as a whole and under the general term of infectious arthritis: I will not consider the rheumatoid, tuberculous or traumatic cases, but will confine my remarks to the more acute types, which are almost invariably termed rheumatism, rheumatic fever, etc.

The disease may be mild in character and of short duration, resulting in complete recovery or it may be very severe resulting in general septic infection and death. It may be confined to one joint, or, by a process of extension may involve many. The degree of extension and the number of joints affected does not determine the severity or prognosis of the case, as only one joint may be the seat of the disease and a fatal termination ensue, yet, on the other hand, many joints may be attacked and perfect recovery without deformity follow.

Etiology.—The disease is rarely primary. Careful inquiry will, in almost every case elicit prodromal symptoms indicative of infection elsewhere and to which the joint trouble may be justly attributed.

Cold, dampness, traumation, previous illness, in fact, any condition that has lessened the vitality and resistance may act as predisposing factors. The lesions occurring in the joint are almost universally believed to be due to the presence within the joint of microörganisms of the same specie as caused the primary disease, carried to the joint, via. circulation or lymph channels, or to a toxemia following infection elsewhere. The inflammation may result from direct invasion of the joint by the staphylococcus, streptococcus, gonococcus, pneumococcus or typhoid bacillus, or it may appear as a sequelae to any of the infectious diseases, as scarlatina, diphtheria, tonsillitis, influenza, (otitis media,) whooping cough, intestinal infection or from some localized infectious process elsewhere, as osteomyelitis, endometritis, or a septic wound.

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*Read before the New Jersey Medical Society.

Symptoms.—These, for convenience may be divided into two classes: Acute and Sub-acute. Under the first classification will appear those cases in which there is a direct invasion of the joint by the microörganism, characterized by the virulency of the infection, severity of the symptoms, and which terminates in suppuration and more or less destruction of the joint. Pain of a very severe character is present, the joint and peri-articular tissues are swollen, skin is red and hot, temperature high, pulse rapid, and a facial expression indicative of great suffering.

Examination of the joint will reveal a complete loss of motion, all attempts at which will be resisted by sharp muscular spasm and voluntary resistance, accompanied by piercing cries of the child, which will prohibit further manipulation of the limb. An examination of the blood will show a high leucocytosis in the early stage and an increase in the percentage of hemoglobin. Aspiration and examination of the joint contents will usually disclose the presence of the germ causing the trouble.

In the sub-acute form the same chain of symptoms may be present only to a lesser degree. The attack is more insidious with occasional complaints of pain. The child does not display its usual activity, tires quickly when at play and prefers to sit or lie around. These symptoms gradually increase, until child will scarcely walk at all, complaints of pain become more frequent, the pulse increases and an elevation of temperature of one or two degrees will be observed. The blood changes will exist as in the acute form but to a lesser degree. An examination of the joint may reveal some swelling, possibly none, and there may or may not be evidence of fluid within the capsule: On examination, the joint will permit of limited motion, which will be fairly free within a certain arc, the amount of which will be governed by the severity of the attack.

Diagnosis.—Every case of joint inflammation should have intelligent study, careful observation of the temperature curve, thorough inquiry concerning the child's actions and gait, for some time previous and an earnest attempt by diligent search to discover the origin of the infection should be made. In the acute form the diagnosis is comparatively easy and will depend upon the rapid development and activity of all symptoms indicating a septic process, the presence of pus in the joint, examination of the blood, lymphadenitis and the general constitutional disturbances.

In the sub-acute form the insidious development might cause it to be mistaken for tuberculosis, or rheumatoid arthritis. In differentiating between infectious and tuberculosis arthritis one will be influenced by the more rapid course of the former, where the pulse and temperature indicates greater activity. An examination of the joint will reveal slight tenderness, a small amount of fluid may be present, and a more marked limitation of motion considering the duration of the attack will be noted. One of the first and characteristic symptoms of tuberculous arthritis is the tendency to early atrophy and flexion deformity, while in the infectious variety atrophy does not appear until quite late and restricted motion is noted early.

In the tuberculous joint the leucocyte count is not exaggerated and the percentage of hemoglobin is below normal early in the disease, adenitis may be present in both diseases, but is generally more characteristic, more painful and more often advances to suppuration in infectious arthritis. Examination by X-ray will demonstrate that the process is more rapidly destructive and more diffuse and that there is a general enlargement of the joint and capsule in the infectious form, while localization of the foci with bone atrophy characterizes tuberculous involvement. Lastly recourse may be had to the various tuberculin tests. The von Pierquet tests seems to meet with greatest favors. Too much reliance must not be placed in this test as it is not without exception, since in the writer's experience only about 50 per cent. of the tuberculous cases have shown a positive reaction, yet coupled with the history and other agents at hand it becomes a valuable asset to our diagnostic investigations.

In rheumatoid arthritis the disease is insidious. It is more commonly poly-articular, and involves the fibrous coverings and capsules of the joints. Atrophy at first takes place in the cartilage and later the bones show this change also. There is a fibrillary degeneration of the hyaline substance which renders the cartilage more friable than normal. The X-ray will show that the articular surfaces are thinned in the center and hypertrophied around the edges while in infectious arthritis the cartilage is of normal thickness and the bones of normal density

Treatment.—This resolves itself into constitutional and mechanical. In the acute form the general health, and eliminative functions should receive careful attention. A restricted diet of easily assimilable foods should be advised during the stage of activity, but after the fever has subsided, a bountiful supply of nourishment should be given in order that the nutrition and resisting powers be increased as much as possible. Such tonics and restorative drugs as may be indicated in the individual case are to be prescribed. The kidneys are to be kept active by the use of one of the alkaline deuretic agents, namely: acetate, of potash or citrate of lithium. The bowels should be kept open and once or twice weekly a calomel purge is of great service, viz. two grs. of calomel and three of soda with sugar of milk. The original source of the infection should be inquired into and if it still exists as a possible exciting cause receive such care and attention as may be indicated. Considerable promise comes from the advocate of vaccine therapy and though the writer has had no personal experience with these, he is led to believe that under proper indications and technique a great benefit will result from their use.

Local Treatment.—In the very acute cases the limb must be immobilized as soon as possible with splints of plaster of Paris or any aparatus that will secure complete fixation of the joint. In a large percentage of cases this will be all that is necessary. However, occasionally the infection of the joint is of such a virulant character that free incision and thorough flushing of the joint becomes necessary. The indications for such heroic treatment will be found in the excessive activity of the symptoms, aspiration of the joint, and bacteriological examination of the fluids obtained. In the very mild cases simple rest and application of 25 per cent. icthyol and lanolene ointment locally will prove sufficient, the case recovering with perfect motion in from two to six weeks. Immobilization of the joint should continue until the temperature becomes normal and has remained so for several days and the child's facial expression indicates an absence of pain, the apparatus is then removed and motion tested. If movement of the joint is painful still then it should be immediately reapplied. If there is no evidence of activity then the limb should be manipulated and an attempt made to restore the full motion to the joint. Naturally, at first these efforts should be mild, the amount of force being gradually increased as tolerance is established.

Your attention is asked to one special indication, namely arthritis of the hip joint. In the severe infections involving this joint dislocation and deformity follow, to prevent which should be an important object in treatment. Early application of a fixation and extension apparatus will prove efficient in preventing this undesirable deformity and occasionally it may be necessary to open and drain the joint also.

Case I.—J. B., female, aged 6 years. Admitted to ward Sept. 30th, 1908. Duration of illness two weeks. Family history negative. History of illness negative. History of injury negative. Examination; manipulation and palpation very painful and no motion, limb is held in a position of 70 flexion deformity. Some swelling and thickening about the joint. No atrophy. Temperature 101°. Leucocyte count 14600. Child was placed on extension and incline frame. Subsequent history: Gradual improvement is noted until Jan. 6th. Motion was found free and normal, was permitted to use limb and on Jan. 25th was discharged as cured.

Case II.—R. G., female, aged 33 years. Dispensary patient. First seen Oct. 4th. Location, left hand. Duration two weeks. Pain and swelling began in thumb and extended to the carpus. Motion is restricted in all directions and very painful. Hand was immediately immobilized. Oct. 14th, motion free in all directions and painless. Splint removed Nov. 4th, no limitation of motion or return of pain. Patient discharged as cured.

Case III.—J. B., aged 3 years, 4 months. Was brought to the dispensary Aug. 14th, 1908. Duration of illness 8 days. Began with fever and vomiting which lasted two days. Child walked with limp and protective gait. The child complained of pain on slight manipulation. Examination revealed slight muscular resistance in all directions, but had no deformity. Child was ordered complete rest and to have applications of

25 per cent. icthyol ointment applied for two weeks, when on examination no pain was elicited and normal motion existed, patient was discharged as cured.

Case IV.—S. I., age two years. Was first seen at dispensary Aug. 30th, 1908. Location, left arm, duration three weeks. Marked limitation of motion in all directions, pain severe and joint swollen. Treatment, immobilization. Nov. 9th motion found to be free, unrestricted, and painless, patient was discharged as cured. No cause could be discovered.

Case V.—Baby M., aged 21 months. I was called in consultation to see this case in Sept., 1909. History: Two weeks prior child suffered from severe attack of gastro-enteritis. One week later it was noticed that the child cried when right leg was handled. Examination: Showed 20 flexion deformity and complete loss of motion. Tissues in neighborhood of hip joint were red, swollen and very painful on palpation. Temperature 103°. Diagnosis of infectious arthritis was made and plaster of Paris spica applied. One week later temperature had reached 105.3° and the child was suffering so much that the spica was removed for aspiration, but as capsule of joint was found very much distended it was incised and the cavity douched and drained, and the spica reapplied so as to permit of changing the dressing. The child's condition gradually grew worse, septic symptoms becoming more pronounced and finally the child died of septic meningitis.

Case VI.—K. D., aged five years, female. Duration six weeks. Patient was refered to me by attending physician. It had been treated with the usual agents for rheumatism. History: About the middle of Sept. child had a moderately severe attack of scarlatina, it fully recovered and was permitted to be about the house. About three weeks from the beginning of the attack, she began to limp and complain of pain in right hip joint. At time of my examination the child had an elevation of temperature 103°, hip was swollen and very painful. Motion limited to 15° with flexion deformity of 20°. Treatment: Extension and immobilization. Child at once began to improve and at the end of four weeks, motion was free and normal, with no evidence of pain. The child was now allowed to get up and in two days walked with perfect freedom. This was undoubtedly due to a toxemia following scarlatina.

Case VII.—J. De V., aged 20 years, June 19th, 1910.

History: Four weeks ago was seized with severe aching pains all over the body. No nasal, pharyngeal or bronchial symptoms. No vomiting, and no diarrhea. A few days later left knee became painful and swollen. The family physician was called and prescribed salicylate of soda and potassium bicarb, diagnosing the case as rheumatism. The pain in the knee soon ceased, but the trouble soon extended to the feet, then to the left hand, passing into the lumbar region and muscles of the neck. Examination: Patient holds head in a protective position, motion limited. Slight pain in left carpus and knees, right carpus and meta-carpo phylangeal joints of the index and second fingers were swollen, red and very painful. Fluctuation perceptible over corpal bones and motion very much restricted and painful. Hand splint applied and patient ordered to bed and placed on a restricted diet. This case was unquestionably an infectious arthritis following influenza. June 26th patient examined and found free from pain with normal motion, except movements of the head, which are slightly limited. Patient seems practically cured.

Case VIII.—This case is given in full, because of its extreme interest. Mrs. O. D., 32 years of age. Family history negative. April, 1903, she stumbled and fell, striking left hip on the sidewalk. Skin was slightly contused and she suffered slight pain on motion but was able to go about attending to her usual household duties. Two months later, while out walking she was taken suddenly with very severe pain and reached home with the greatest difficulty. She suffered greatly all night and could scarcely move, or turn over in bed. The next morning she was able to get downstairs after great effort and by night the pain was so great that she could not get back to her room. For three months she suffered excruciating pain, so much so, that at times she almost lost conciousness. The skin was reddened, inflamed and the joint very much swollen. She was treated by different physicians all of whom agreed that she had rheumatism. After about four months the patient was able to go about on crutches, which she used for nine months. She was examined two and one-half years after the primary attack and felt pain only on arising quickly from a sitting position. She walked without pain or disability but with a slight limp. The limb was very much atrophied, with 35 degrees of flexion and 15 degrees of adduction deformity. Joint ankylosed, no true shortening but one and one-half inches of apparent shortening due to adduction and flexion.

The patient's limb was thoroughly manipulated under anesthesia, limb placed in straight line and spica of plaster of Paris applied. At present writing there is about one-half inch shortening and five flexion deformity and 15 of free motion. Patient is greatly improved, but the function was not perfect. Patient refused further manipulation, saying she "is satisfied." Sits down and arises without pain.

Case IX.—Mrs. A., aged 43 years. History: About 12 or 13 months ago had severe pain in neighborhood of right hip joint, was treated for stone in bladder, la grippe and rheumatism. One week later, while attempting to get on the commode she felt something snap in the thigh and fell to the floor, twisting her leg as she fell. She was placed in bed and local applications applied without extension for two months. She was confined to bed for 10 months and has been going about on crutches ever since. Present examination: Pain in thigh extreme, joint ankylosed and thickened, slight tenderness on palpation, one-half inch true shortening and one and one-half apparent shortening. General health good, ambulatory brace advised. This case is interesting because two very prominent orthopedists diagnosed this case as partial traumatic dislocation. After considerable effort, I learned that the patient had a vaginal discharge and that a short time previous her husband had contracted gonorrhea and what was diagnosed as dislocation of the hip was really an infectious arthritis of gonorrheal origin. These two illustrate cases which might be classified as traumatic arthritis, but the latter undoubtedly was proven to the contrary and I believe the former was because of the two months intervening before the appearance of real active symptoms, which developed suddenly and while I was unable to obtain the history necessary to prove the source of infection, some facts may have been withheld.

Case X.—Aged 19 years. This case illustrates one of infectious arthritis following a steomyelitis of pneumococic origen. First seen June 6th, 1910.

F. N., male, aged 17 years. Personal history: 18 months ago had pheumonia, soon after his right leg began to swell and was very painful. Was treated for rheumatism for one week, not improving he went to St. Joseph's Hospital. The leg was opened and a small piece of "black bone was removed" from tibia, two and one-half months later it was opened and curetted, three and one-half months later it was curetted again. Patient is not clear as to the time the ankle joint became involved. Was refered to my clinic June 6th. Examination shows open wound in middle third of tibia. (Site of operation) small discharging sinous at inner side of ankle joint and over middle external surface of os caleis which has been closed one week.

No motion permitted in ankle joint. Refered to Surgical clinic for treatment until wound is healed, after which manipulation and efforts to restore the function will be attempted.

INTUBATION FOR THE RELIEF OF STENOSIS IN LARYNGEAL DIPHTHERIA.*

BY

P. D. LIPSCOMB, M. D.
Richmond, Va.

As the fall season has come and the diphtheria period approaches our program committee seemed to think it proper to bring before the Academy some phase of diphtheria; so I have selected as the subject of this brief paper *Intubation for the Relief of Stenosis in Laryngeal Diphtheria.*

This operation was first attempted about 1855 in Paris, but met with scant approval. Trousseau opposed it so strongly that it fell into disrepute for about 20 years until 1880, when O'Dwyer of New York, revived the subject. He did so chiefly because of the high death rate of tracheotomy. He, likewise, met with little or no encouragement for a long time, but on account of his persistent work, and by the assistance of Waxham of Chicago, intubation finally received the marked recognition to which it was entitled; and now it is accepted everywhere as the operation of election in laryngeal diphtheria requiring operative intervention. We are told that in a Paris hospital in the wards named after Trousseau, the bitter opponent of intubation, the operation is now performed on all cases needing it.

Intubation became rather popular some twelve or fifteen years before the introduction of antitoxin, but the operation was attended by a mortality high enough to prevent its enthusiastic adoption. Not until antitoxin became perfected and was put into universal use did intubation offer such sure and permanent relief to that class of laryngeal cases which would almost invariably die of suffocation without the operation. In pre-antitoxin days, the mortality in intubation cases was about 80 per cent. In the past 10 years, the mortality in intubation cases has been about 30 per cent., the notable reduction being due apparently entirely to the early and persistent use of antitoxin in sufficiently large quantities to produce the desired effects. It is quite impossible to say what effect antitoxin has upon the mortality of tracheotomy, for since the introduction of intubation, tracheotomy has been entirely abandoned except where intubation cannot be had, or in a small number of cases of tracheal diphtheria in which the membrane develops below the point of the intubation tube.

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A very limited experience will convince the operator of the difficulties encountered in securing the consent of the parents to tracheotomy. This was usually responsible for the postponement of the operation until the child was moribund, so the results were very discouraging. Intubation, being a bloodless operation and not requiring an anaesthetic, and with the unqualified assurance that it is the very best thing to be done for the patient; that the relief of the distressing dyspnea is instantaneous, and that the chances of recovery are greatly increased, there is usually little difficulty experienced in getting the consent of the parents to the operation, and, hence, the lives of many children are now saved that would otherwise be lost. While the indications for immediate operative intervention, whether it be intubation or tracheotomy, are very clear, it is a matter of great importance that the operation be not postponed too long while the laryngeal stenosis is developing. It is, therefore, highly important not to confuse catarrhal croup with stenosis of the larynx due to invasion of diphtheritic exudate.

Without going into the symptomatology of catarrhal croup, it might be well to recall that it usually comes on suddenly in the night, that the attacks are intermittent, and are generally relieved either temporarily or permanently by an emetic. This is not true of membranous croup, the symptoms of the three stages of which are so succinctly stated by Welch and Schamberg that I quote from them as follows: "In the first stage the symptoms consist of cough and hoarseness, in the second of aphonia and dyspnea, and in the third of suffocation and asphyxia, speedily ending in death if relief is not afforded."

With the active onset, the swelling and exudate within the larynx gradually increase, respiration becomes more difficult, and dyspnea more distressing. Retraction of the sternum and sinking in of the lower ribs are noticed with every inspiration. The face becomes livid from lack of sufficient oxygen. The child is restless, and looks vainly in every direction for relief. A more pitiable condition than that of a little child suffering from an advanced attack of membranous croup is rarely seen. The physician who insists upon surgical consultation in an obscure or suspected condition will not delay in these cases when delay means little less than criminal neglect.

There is a class of cases not so severe as that just described, yet in my experience requiring intubation. I refer to the cases that have decided stenosis of the larynx, but are not in imminent danger of suffocation. If no improvement in the breathing is noted in the preceding eight or ten hours, and the case is accessible, it is unwise to permit it to go over night without a tube. Otherwise it should be watched closely and allowed eight or ten hours more, by which time there will either be improvement or the general condition will appear decidedly less satisfactory, and the patient, especially if a young child, is gradually wearing out, and is in danger of death from sudden collapse due to sheer exhaustion or from fatal stenosis of the larynx. Intubation affords instant relief, and the child lapses into quiet sleep and much needed rest, neither of which he has probably had for perhaps twenty-four hours, and wakes greatly refreshed and wonderfully improved.

Whether laryngeal diphtheria exists as a primary condition, I am unable to say, but it is distinctly a local condition and it is true that laryngeal cases offer a hopeful prognosis. Rarely does a septic condition follow intubation of the larynx, provided it is done in time, and the frequent absence of constitutional symptoms may be due chiefly to the scarcity of lymphatics in the larynx and traches.

Dangers and Difficulties of Intubation.—The operation is not dangerous when performed by an experienced operator. Instances have occurred when the exudate was pushed down into the trachea by the tube, giving rise to serious if not fatal complication but this rarely happens. At Willard Parker Hospital, New York City, where, in the heavy diphtheria season, intubations are done every day, it occurred only once in my service of twelve months, and was relieved by immediate extubation. This patient expelled a large mass of dislodged membrane and did not require re-intubation. A clumsy operator might produce asphyxia by prolonged attempts at intubation, or laceration of the tissues, or perhaps a false passage by forcing the tube into one of the ventricles of the larynx. This can hardly occur with the O'Dwyer tube so smoothly and neatly finished at the point. All of these accidents have occurred but with care are easily avoided. Occasionally when the point of the tube enters the glottis a sharp spasm is excited in the muscles of the larynx, so that to force the tube in might do damage. It is best to wait a few seconds for relaxation, when the tube will enter easily. If, on account of swelling, edema or inflammatory thickening of the tissues within the larynx, it is found that too much force is required to insert the tube that corresponds to the age of the patient, a smaller tube must be used temporarily. This can very soon be replaced by the proper tube. It is true that broncho-pneumonia and bronchitis occasionally follow intubation, but it is equally true that fatal results may follow collapse of lung tissue to which air does not have access, and that stenosis excepted, broncho-pneumonia and bronchitis are the principal sources of danger in membranous croup, and that this danger is increased rather than diminished by tracheotomy.

Removal of the tube.—The length of time the tube remains in depends upon the stage of the disease, the age and general condition of the patient. Young children will require the tube longer than older ones. If the tube is not inserted until late in the disease it may be removed early. The average patient who does well, I extubate usually on the fourth of fifth day, even if the tube has to be reinserted. In septic conditions with a profuse purulent discharge in the larynx and trachea, the tube is removed for cleansing as early and as often as is necessary to keep it clear. Should the edema and swelling within the larynx subside earlier than was anticipated, the child may cough the tube up and swallow it. No uneasiness on this account should be felt, as the tube always passes through the intestine.

Prolonged Intubation.—Before closing this paper, I wish to refer to the condition of prolonged intubation, designated as a "chronic tube case." Despite the free and early use of antitoxin, and the greatest care in the process of intubation and extubation, about once in a hundred times it happens that the tube can not be dispensed with at the proper time for extubation. The tube must be reinserted over and over again through a long series of operations. This is an unfortunate occurrence, thoroughly perplexing to the operator, and very distressing to the patient. It also occurs equally as frequently with the tracheotomy tube, and is due to persistance of false membrane in the larynx or trachea, to thickening of the soft parts, or to organization of exuberant granulations, resulting in cicatricial contraction. When I was connected with Willard Parker Hospital, there were several such cases there. Two of them were sent to another hospital where a preliminary tracheotomy was done, and the larynx subsequently curetted. One made a satisfactory recovery, the other died. I am informed that the remainder of these cases followed the usual course and died of some intercurrent affection—one or two of scarlatina, one of measles, etc.

The latest approved treatment for chronic stenosis of the larynx which is, fortunately, rare, is long continued intubation until the granulation tissue subsides and the cicatrices cease to contract. Fortunately, I have had no such case to deal with outside of the Willard Parker Hospital.

I take just a moment to refer to the intubation cases I have treated in Richmond. I have classified them according to the demand for operation and find that there are six cases which may be classed as non-urgent and ten cases as urgent, making sixteen cases in all. Of the non-urgent, the tube was used in Nos. one and sixteen because of distinct indications and inaccessibility of the patients. In No. nine, it was used because of distinct indications, tender age (six months) and inaccessibility of the patient. In Nos. three, seven and eleven, it was used because of distinct indications. The following cases were urgent. In No. two, the tube was used because of intense dyspnea. The patient was seen in the third stage, and died in less than three days of septic intoxication. In No. ten, it was used because of intense dyspnea. Patient was first seen at the end of the third stage and died in two hours of septic intoxication. It had been ill for more than a week and was sent from the country for diagnosis. In No. fourteen, it was used because of marked dyspnea. Patient was first seen at the beginning of the third stage. The temperature was over 106 degrees, and death ensued in two and a half days of septic intoxication. Patient had been sent in from the country for diagnosis and treatment. In No. five, the tube was used not so much on account of urgent but, rather, for prolonged, dyspnea to which the patient was rapidly succumbing when first seen. In Nos. four, six, eight, twelve and fifteen, the tube was used because of intense dyspnea; otherwise uncomplicated. In No. thirteen, it was used because of extremely intense dyspnea. The patient was in imminent danger of immediate suffocation.

It is fair to say that case six died of lobar pneumonia and purulent pleurisy, as postmortem examination showed, 20 days after the first intubation. This patient was intubated and extubated four times in the 20 days, and was never able to go without the tube more than a half hour at a time. This is the only case in my series that bordered on chronicity; and the patient died of complications before a definite diagnosis as to that condition could be established.

I have had four deaths in 16 cases, giving a mortality of 25 per cent. which is five per cent. lower than the reports from the contagious disease hospitals of the larger cities show. If I may exclude cases two and ten, which were hopeless when first seen and promptly died, and case fourteen, an infant 20 months old, neglected for one week, with a temperature of over 106 degrees when first seen, we have the single instance of one case which died of pneumonia and purulent pleurisy which may, perhaps, have been a result of intubation. Of this we are not at all certain.

Five other cases, besides the ones already mentioned, seen in consultation, presented definite signs of laryngeal involvement, but the stenosis was not sufficiently intense to require intubation.

In conclusion, I may summarize as follows: (1) Intubation is safe if done by an experienced operator. (2) Before the use of antitoxin, 75 per cent. of intubation cases died. Now, with the use of antitoxin, 75 per cent. of incubation cases recover. (3) If an operation is necessary, intubation should be preferred. (4) When indications are clear, intubation should be done at once.

1603 W. Grace St.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE.

Diseases of the Nervous System in Children.

Under the Charge of

ARTHUR WILLARD FAIRBANKS, A. M., M. D.

Instructor in Clinical Medicine, Tufts Medical College; Attending Neurologist, Children's Hospital, Boston.

[There will appear each month not a resume of the literature of the previous month, but a review of the advances made during the preceding year in the study of the various neurotic and psychical disorders of early life. It is intended to present a concise account of the most important contributions to our knowledge of the various subjects selected each month. If the plan meets the approval of the readers of the journal, we hope, as time goes on, to cover as much as possible of this interesting branch of medicine.]

Anterior Poliomyelitis.—By far the most important advance of the past year in the domain of the nervous diseases of early life is the demonstration of the infectivity of acute anterior poliomyelitis. Long suspected of belonging to the great group of parasitic diseases, on the ground of its distribution and clinical course, this affection, now occupying the attention of the entire medical world on account of its unprecedented prevalence, has been proved by the laboratory researches of Flexner and Lewis in this country and Romer in Germany, to be, beyond any question, a zymotic disease. Their results have been confirmed by the further experiments of Leiner and Wiesner; Landsteiner and Popper; Levaditi; Strauss and Huntoon; Knoepfelmacher; Krause and Meinicke, and others. Up to the present time the disease, as far as its nervous manifestations are concerned, has been produced only in monkeys, but the virus has been transmitted from monkey to monkey without diminishing its virulence. It has caused death in rabbits apparently by septicemia, but it has not caused poliomyelitis.

The most salient results of these numerous investigations are the following:

That the virus, although proven to be present in emulsions of the brain and cord, and in the cerebro-spinal fluid, is not rendered visible by any known method of bacteriological technic.

That it does not grow on any culture media by any present known methods, although instances have been reported in which the culture medium has become cloudy, without revealing any vissible organisms on microscopical examination.

That the virus passes through the Berkefeld filter (porcelain); that is it belongs to the class of filterable virus.

That it is preserved, not destroyed or diminished in virulence, by long immersion in glycerin.

That it withstands freezing for as long as forty days, and remains active in the cord kept at 4° C., for fifty days, and retains its virulence after being dried in a dessicator over KOH for one week.

That it is easily destroyed by a one per cent. solution of hydrogen dioxide.

That it is present in the naso-pharynx of monkeys, suffering from the disease produced by the intra-dural inoculation of virus obtained from the central nervous system of fatal cases.

That the disease can be produced by inoculation through the naso-pharynx in monkeys, (a single instance reported by Flexner and Lewis).

That the virus is present and virulent in the cerebro-spinal fluid several days preceding the onset of the paralysis.

That, in other words, an incubation period of several days, (six to ten), exists even after direct injection of the virus intracerebrally.

That one attack confers immunity for subsequent inoculation, at least experimentally.

That repeated inoculation of small doses of the virus, although causing no symptoms of poliomyelitis, confers immunity for subsequent inoculation of doses of the virus that are morbid or lethal for animals not so immunized.

Such are the most interesting results of the attempt to unravel the secret of this widespread disease. While much remains to be done, it must be recognized that these facts are of the most vital importance in the eventual solution of the problem. Certainly nothing more brilliantly illustrates modern advance in the methods of study of disease, than the rapid establishment, within a few months' time, of these important facts in regard to an affection so long a baffling problem to the entire medical world.

Spastic Paralysis.—Perhaps no cases are seen by the pediatrician, the orthopedic surgeon and the neurologist more discouraging in outlook than the numerous instances of spastic paralysis. From time immemorial muscular spasm has been generally considered by neurologists an exclusively motor phenomenon.

These spastic cases are seen when there is a lesion somewhere in the upper or *central motor tract*, that is; above the cells of the anterior horn, some where in the motor tract between them and the motor cortex of the brain-

The spasm is due to the independent action of the sub-cerebral centres of muscular tone, no longer inhibited by the cerebrum, because of the interruption by the lesion in the inhibitory (pyramidal) tract.

It has recently been suggested that this muscular hypertonicity depends, for its occurrence and for its persistence, upon something more than mere unrestrained muscular tonicity; that it is rather the result of sensory irritation, through the posterior sensory roots from the periphery to the centres for muscle tone, and thence through motor pathways to the muscles. It is obvious that such sensory irritation, if it really conducted to the sub-cerebral centres presiding over muscular tonicity, must be so conducted all the time in every normal individual, and we are forced to assume that normally some inhibitive action elsewhere prevents the occurrence of muscular spasm under normal conditions. Both clinical and experimental evidence has indicated that this control is exerted by the cerebrum, for it is in lesions of the motor pathway from the cerebral cortex down to the gray matter in the anterior horns of the cord, that muscular spasm occurs. Upon the hypothesis therefore, that muscular spasm is due to the effect of sensory impulses coming in from the periphery and exciting the muscle-tone centre to unrestrained activity, the suggestion has been founded to relieve this spasm by division of some of the posterior (sensory) nerve roots. This has in fact been done.

First suggested by William G. Spiller of Philadelphia in 1905, the operation was first carried out three years later by Foerster, in Germany, and shortly thereafter by Tietze, Gottstein, Kuttner, Clarke and Taylor, and Spiller and Frazier. The degree of success attained in some of these cases is such as to give us hope that a means has been discovered of considerably alleviating a trying and pathetic condition frequently existant in early life. The question will be considered further next month, and the progress followed in the future as time proves the transient or permanent character of the benefit already obtained by the procedure.

Influence of the Thyroid on the Regeneration of Peripheral Nerves.—Walter (*Deut. Zeitsch. f. Nerverbeilk,* Bd. 38 heft) comes to the following conclusions as a result of a large number of experiments on rabbits: —(1) The complete removal of the thyroid in rabbits is so great a hindrance to degeneration and regeneration processes of peripheral medullated nerves, that at the place of operation, even after two months, there is scarcely a regenerated fibre to be seen. (2) Relatively small glandular remnants are sufficient to prevent this hindrance; very small pieces, however, only lessen it.

(3) This stoppage of regeneration is not to be explained as a part of a general slowing of metabolic processes and cachexia strumipriva, since it does not run a parallel course to them and may occur in their absence. (4) A specific action of the gland on the nervous elements must be admitted. These elements include both the ganglion cells and the cells of the sheath of Schwann. (5) Feeding with thyroid tablets is immediately followed by a continuance of the degeneration and regeneration processes, and if the correct dose be given the tablets completely replace the gland. (6) In normal animals feeding with the tablets has probably no effect on these processes. (7) The parathyroid glands do not show the above described action of the thyroids, which indicates that there is an essential difference between them. (8) The removal of all parathyroid glands results in the death of the animal with tetanic symptoms in a few days. (9) The hypophysis constantly increases in size—often to many times its original volume—in thyroidectomised rabbits.

Diseases of the Alimentary System.

Under the Charge of

JAMES WARREN VAN DERSLICE, M. D.

Assistant Professor of Pediatrics, Rush Medical College, Chicago, Ill.

The Stools in Infancy.—(*New Orleans Medical and Surgical Journal*, Aug., 1910). Morse says, that it is more difficult to draw conclusions as to processes going on in the digestive tract from the examination of the stools than would at first appear but adds that it is possible in most cases to determine whether any given food element is properly digested and assimilated or not, and in many diseased conditions to tell what element is at fault. The reaction of the normal stool depends on the relation between the fat and the proteids in the food. When there is relative excess of fat the reaction is acid; when there is relative excess of proteid the reaction is alkaline, the reaction depending, in the one case, on the products of the decomposition of fat, in the other on the products of the decomposition of proteids. The carbohydrates have no effect on the reaction of the normal stool. The reaction of the stools is of comparatively little importance from the clinical side. It is best tested by placing wet red or blue litmus paper on, not in, the stool. Of curds there are two kinds, one primarily composed of casein, the other composed mainly of fat, mostly in the form of fatty acids and soaps. The small amount of fat in the casein curds and the small amount of proteid in the fat curds are mere incidents. When casein curds are placed in formalin they become hard as rocks; they are insoluble in ether. The fat curds are easily broken up by pressure and, when shaken up in water, tend to remain in suspension. They are unaffected by formalin.

Amebic Dysentery.—(*W. Virginia Med. Jour.*), Nydegger states that this disorder is a most common disease in the temperate zone and the common form of dysentery in the United States. The finding of motile amebae in the stools makes the diagnosis. He obtains the specimen of the stool for microscopic examination by first giving a saline purge and having the second or third stool passed into a warmed vessel, and with a wire loop fishes up a fragment of blood stained mucus. In cold weather it is necessary to have warmed slides and a warmed stage. The motility of the ameba is lost at 70° F. and is not regained if left in that temperature for a short time. A positive diagnosis cannot be made unless the motile organism is detected. The treatment to be effective must be applied locally. The use of carbohydrate food must be refrained from. He recommends high colonic flushings of cold saline or quinine solutions, and the surgical interference by appendicostomy.

Further Report on Ileocolitis Complicated by Acidosis.—(*Jol. A. M. A.*, Sept. 17, 1910), Parke states that he has been unable to find a description of this syndrome in the text-books and believes that the condition is not confined to one area. He has observed thirteen cases. The condition has occurred in breast fed, well nourished children, previously healthy. The oldest child attacked was two and a half years of age. The symptoms are diarrhea caused by a mild grade of ileocolitis and lasting from one to four days, precedes the onset of the typical symptoms. Then labored breathing develops, often suddenly, followed by prostration, restlessness, obstipation, enlargement of the liver. The temperature in some cases becomes subnormal, in others stands around 100° F. in a few runs high. Vomiting with acetone odor of breath occurs in a good proportion of the cases. The urine is limpid and free. Albumin has been present in some and absent in others of the few cases from which urine could be obtained.

In fatal cases death occurs in forty-eight to seventy-two hours; in cases terminating in recovery the duration of labored breathing is about the same. Death seemingly occurring from exhaustion. The mortality has been seventy-two per cent.

Agar-Agar in the Treatment of Constipation in Childhood.—(*Jol. A. M. A.*, Sept. 10, 1910), Morse says that Agar-agar has the property not only of absorbing water, but also of retaining it in its passage through the intestinal canal. It thus increases the bulk of the feces and prevents the formation of hard fecal masses. This peculiarity, together with its resistance to bacterial decomposition, suggests its use in that form of constipation which is due to complete digestion of the food and to complete absorption of the water from the intestinal tract, the stools being as the result small and very dry. Owing to the nature of its action no habit is produced and it is not necessary to increase the dose. The greatest difficulty encountered has been in inducing children to take the agar-agar. Most of them can be induced to take it if it is cut up into flakes about the size of bran and cooked in the cereal. It can usually be given to the others in broth or soup, if it is thoroughly cooked before it is mixed in. Several hours hard boiling are necessary. Children four and five years of age need as a rule about two teaspoonsfull of dry flakes daily. This weighs about a dram.

Cyclic Vomiting in Children.—(*Jol. Ind. State Med. Soc.*, Aug. 15, 1910), Beall states that in view of the similarity of the symptoms and post-mortem findings in cyclic vomiting to those recognized as acid intoxications we are justified in assuming that cyclic vomiting is an acid intoxication. In both experimental and clinical acid intoxications the administration of alkalies is the rational procedure on clinical as well as theoretical grounds, hence in cyclic vomiting the administration of alkalies in large quantities is imperative.

Cyclic Vomiting in Children.—(*Arch. de Med. des Enf.*, Oct., 1909), Comby reports 104 cases of recurring attacks of vomiting. The attacks lasting from one to four days occurring most frequently in children from two to six years of age. The sexes were equally affected. In six cases two or three members of a family had been affected. In sixty-two there was a definite family history of neurotic or gouty disorders. Appendicitis, dyspepsia or some infectious disease frequently preceded the onset of the vomiting. The attacks came on suddenly with constipation and prostration. The temperature in some cases was high, in others normal or slightly elevated. Comby found appendicitis in fifty of his cases and he advocates appendectomy as the best method for stopping the recurrence. Treatment consisted in giving alkalies to overcome the apparent acidosis. The author notes that there is usually a sweet or acid odor to the breath prior or during the attacks.

Diphtheria of the Intestines.—(*Montreal Med. Jol.*, Aug., '10.), McKechnie reports the case of a girl six years of age taken with an apparent mild attack of dysentery. The condition persisted for three weeks; the stools were small and frequent consisting of blood streaked mucus and pus. Enormous quantities of streptococci were found and these disappeared after the exhibition of streptolytic serum, but the symptoms persisted. Finally cultures showed bacilli of the diptheritic type. Antidiphtheritic serum was then used with immediate improvement, two days later a complete cast of the bowel four inches in length, was passed, followed by slow convalescence with paralysis of the sphincter ani and absence of the knee jerks.

Disorders of Inanition.—(*La Clin. Infant*, May, 1909). G. Variot draws attention to the fact that insufficient food is as dangerous as over-feeding. Pointing out that the underfed child vomits as well as the overfed. Variot cites a case of a boy six weeks of age given 100 gr. of breast milk per kilo weight who had never gained in weight and the stools were unhealthy and dark. He increased the quantity of food with immediate increase in body weight and a clearing up of the bowel movements. He states that if there is a persistance in giving vegetable broths under pretext of combating a gastroenteritis the child's condition becomes worse. This kind of vomiting quickly yields to an increase in aliment especially if citrate of soda be added to the cow's milk if given.

He states that it should be realized that the gastro-intestinal reactions in hypo alimentation are very much the same as in overfeeding, that is to say, gastric spasm may supervene and this cause of vomiting deserves to be recognized. Before reducing the diet of a nursling who vomits, a precise inquiry should be made concerning the amount of food he absorbs, and the conclusion that he has been overfed should not be made without definite information and due reflection.

The Treatment of Chronic Constipation.—(*Lancet*, August 13, 1910). Goodhart says: In early life constipation is caused by an abnormal distension of the intestines by too frequent feeding or by the use of unsuitable articles of diet. That the changes are primarily mechanical and secondarily toxic.

Diseases of the Respiratory System

Under the Charge of

THEODORE Le BOUTILLIER, M. D.

Professor of Pediatrics, Woman's Medical College; Visiting Pediatrist to the Dispensary of St. Christopher's Hospital for Children, etc., Philadelphia.

Surgical Mistakes of Infancy and Childhood.—S. W. Kelly, (*J. Am. Med. As.*, 1910. Vol. lv. p. 829), in an article on Surgical Mistakes in Infancy and Childhood, draws attention to the danger of overlooking the initial cough of pertussis. In one case an operation for harelip done without regard to the incipient cough of pertussis resulted fatally from pneumonia, the development of which was probably favored by the hemorrhage from and infection in, the torn stitches. Numerous instances also are recorded of the referred pain from pulmonary disease being mistaken for acute abdominal conditions.

Hemiplegia With Loss of Voice Following Whooping Cough.—Domars (*Deutch. Archiv. fur klin. Med.*, 1910. XCIX), describes a case of pertussis followed by right hemiplegia with loss of voice, and reports hemorrhagic encephalitis found at autopsy in five similar cases.

Symptoms of Whooping Cough—Reliefs for.—Bradt, (*Therapie der Gegenwart*, 1910. LI.), believes that the symptoms of pertussis are in large part due to conditions in the upper air passages and advises swabbing the naso-pharynx once a day with a solution, in 100 c.c. water, of Iodin and phenol each 0.5 grammes. Potassium iodid 1.5 grammes and glycerin 15 c.c.

Heart Sounds in Chidren.—J. E. H. Sawyer, *Brit. Journ. Children's Dis.*, July, 1910), believes that briuts over the manubrium sterm with the head bent back are heard in the great majority of children, and explains their production by the stretching and compression of the jugular veins. An apparent confirmation of the theory is found in the fact that, when the head is bent to one side, the bruit is often heard only on the side which is on the stretch. Additional evidence is thus presented of the necessity for caution in interpreting muscular sounds heard over the upper sternum.

Tuberculosis in Children.—In conjunction with R. Monti, Franz Hamburger (*Brit. Med.*, June, 1910–July, 9. P. 76), has investigated the incidence of tuberculosis among the children of the lower classes in Vienna.

They selected cases who were suffering from some acute infectious disease (scarlatina or diphtheria). All of the children were first tested by the von Pirquet cutaneous reaction. Those reacting negatively were, after two days given subcutaneous injections of one mg. of tuberculin. Those cases which showed a distinct inflammatory reaction at the point of injection, of at least three days duration, were considered to be tuberculous. Of 532 children suffering from diphtheria, or scarlatina, 271 reacted positively. Dividing the cases into six age periods, they found the following percentages:

1st	Year	2	Per cent
2nd	"	9	" "
3–4	"	27	" "
5–6	"	51	" "
7–10	"	71	" "
11–14	"	94	" "

That 94 per cent. of persons over 14 years of age are tuberculous would, the authors state, appear almost incredible were it not for the fact that tuberculosis in childhood is relatively harmless and often runs its course without giving rise to any symptoms. It is important to appreciate the difference between tuberculous infection and tuberculous morbidity.

According to an approximate calculation, the mortality from fresh tuberculosis in the several age periods is as follows:

1st	Year	70	Per cent.
2nd	"	10	" "
3–4	"	7	" "
5–6	"	2	" "
7–10	"	2	" "
11–14	"	1	" "

It is, therefore, clear that tuberculous morbidity decreases from year to year although the incidence of tuberculous infection increases from year to year. The statistics regarding the incidence of tuberculosis diagnosed by means of the tuberculin reaction are confirmed in recent years, by careful and exhaustive autopsies. The discrepancies between these and the earlier autopsies are explained by the greater care now taken in searching for tuberculous foci. Hamburger especially emphasizes the fact that his figures refer only to the poorer classes and that the incidence of the disease among the better protected children of the well-to-do is probably much less.

Von Pirquet's Test in Children With Tuberculosis.—W. P. Lucas, (*Cleveland Med. Jour.*, 1910. P. 599), in a consideration of the von Pirquet test employed on 418 patients in the Children's Hospital, Boston, concludes that it occupies a definite and useful place as an aid to diagnosis, but that the physical examination, the past and family history, and, especially, the possible exposure to infection, are decidedly the most important factors. A cutaneous test which appears rapidly, produces a marked reaction and remains for a long period, should be taken seriously into consideration in forming one's opinion of a case. The converse, however, is not true. A negative test may mean anything. From our present understanding of the reactions, a positive reaction indicates the presence of a sufficient number of free tuberculous anti-bodies which are drawn to the point of inoculation and there cause a local necrosis of the superficial cells which have absorbed the toxin found in the tuberculin—The more free anti-bodies, the greater the necrosis. A latent or subacute tuberculous process will probably have enough free anti-bodies generated to produce a more or less marked reaction (necrosis). An active or acute tuberculous process may behave in two different ways—If at the time the test is made, the production of anti-bodies is in excess of the amount of toxin (with which it is able to enter into combination) there will be a marked local attack producing necrosis of the cells which have absorbed the test toxins. If, however, the organism is overwhelmed by the toxins of the original tuberculous infection, with the result that few or no anti-bodies are produced, none are therefore available for the production of a reaction at the point of inoculation—As the number of anti-bodies varies throughout the course of the disease, a negative test on one day may be followed by a positive one at a later date. These facts are of great importance in enabling us to understand the variability of the cutaneous reaction.

The Active Principle in Tuberculin.—Vaudremer (*Annal. de l'Inst. Pasteur.* March, 1910), from his study of the action of various micro-organisms upon tuberculin, concludes, that the destruction of the latter by microbes is due to their producing proteolytic properties—and, that the active principle of tuberculin is probably a toxal bumin which comprises one of the elements of bacterial protoplasm.

A Clinical Lecture On Acute Laryngeal Dyspnoea In Children.—by Harold Barwell, (*Lancet*, August 13, 1910), says that one reason why laryngeal obstruction is commoner in children is that the lumen of the glottis is not only absolutely but relatively small for the needs of the organism. That the principal reason why laryngeal obstruction is so common is that the tendency to spasm of the glottis is far greater in the early years of life, when the nervous system is most sensitive and the reflexes most active. He emphasizes the diagnostic point that in laryngeal obstruction there is well-marked inspiratory stridor, while expiration is comparatively easy. The causes in the majority of the cases are due partly to spasm and partly to mechanical reduction in the size of the lumen. He divides the treatment under two heads; that during the paroxysm and that of prophylaxis. He advocates counter irritation of the conjunctiva and a hooking forward of the epiglottis with the finger, and the inhalation of amyl nitrite.

On The Use of Morphine in Acute Spasmodic Affections of the Larynx in Infants.—(*L'Echo Med. du Nord* Nov. 7, 1909). Delecude and Swynghedau advocate the use of morphine in these cases, quoting fifteen cases in most of which morphine was used with great success, either relieving the necessity of intubation or lessening the time the tube was used. They are careful not to administer morphine if there is any pulmonary affection however mild. They do not give more than 0.003 gramme at a dose to a child 12 to 18 months of age. They quote other observers as concurring in their advocacy of this treatment.

Infectious Diseases

Under the Charge of

MAURICE OSTHIEMER, A. B., M. D.

Instructor in Diseases of Children, Univ. of Penn., Physician in charge of the Children's Dispensary of the University Hospital; Assistant Physician to the Medical Dispensary of the Children's Hospital
Philadelphia.

Epidemic Cerebro-Spinal Meningitis

Symptomatology and Treatment.—Jules Comby, (*Archives de Medecine des Enfants*, March, 1910), observed fifteen cases of epidemic cerebro-spinal meningitis during the first five months of 1909, while he was able to collect only sixteen cases in his practice during the six years preceding. Before using the serum treatment his mortality was 75 per cent.; now it is 20 per cent. Nineteen of the 31 cases studied occurred during January, February, March and April. Comby has yet to see a case develop by direct contagion in home or hospital. The ages of thirteen of the cases varied from four months to two years, while eighteen were over two years of age. Kernig's sign was present in only twelve cases. Symptoms which were found in almost all cases were rigidity of the neck, with retraction of the head; tache cerebrale; herpes; convulsions and strabismus. Meningococci were found in the cerebrospinal fluid from every case. Comby employed antimeningococcus serum in fourteen cases, the individual cases receiving from one to twelve injections. Eight of ten cases given Dopter's or Flexner's serum recovered, while two died. The four casess treated with Kolle's serum died. Finally Comby lays stress upon keeping the nasopharynx clean.

Diagnosis and Treatment.—S. Marx White, (*Northwestern Lancet*, August 1, 1910), reports in detail two cases of epidemic cerebro-spinal meningitis successfully treated by Flexner's serum. The first case, a boy of three and one-half years, received nine injections; the second, a woman of 22 years, received five injections. The boy received the first injection on the second day of illness; the woman, on the third day. From this limited experience White concludes that it may be difficult or impossible to find Gram-negative intracellular cocci in the exudate in certain cases of infection with diplicoccus intracellularis meningitidis. In the presence of positive symptoms of meningitis and with the absence of an etiologic factor such as pneumonia, endocarditis or injury, and when the fluid removed is cloudy, giving positive evidence that a meningitis exists, then Flexner's serum should be used as though the presence of the diplococcus intracellularis meningitidis were proven, until such time as cultures or other evidence reveals the nature of the infection. It is only the occasional case in which one will need to wait for the results of culture before making a positive diagnosis. As a rule the diplococci may be found in the first smear examined.

Flexner's Serum in the Treatment of Cerebro-Spinal Meningitis.—Homer Woolery's paper, (*Lancet-Clinic*, July 30, 1910), is a plea to the physicians of Indiana to use Flexner's serum in the treatment of epidemic carebro-spinal meningitis. If they perform lumbar puncture in all suspicious cases and send the cerebro-spinal fluid removed to him, he promises to obtain the serum for them in all positive cases. He quotes Flexner's statistics to show the success following its use, giving the details of its administration from Dr. Charles Hunter Dunn's article in the Boston Medical and Surgical Journal, (1908, CLIX., page 743). Woolery has had six calls for the serum, in only two of which was the infection due to the diplococcus intracellularis. One, an infant under one year, in the fifth week of the disease, was moribund, dying sixteen hours after the first and only serum injection. The other case, a girl of fourteen years, was seen on the fifth day of illness. Her temperature became normal 18 hours after the first injection and she was perfectly comfortable; five days later she was symptom-free, having had only two injections of 30 c.c. each.

Cerbro-Spinal Meningitis, due to Meningococci and Streptococci in a Patient who had formerly had Otitis.—Collignon and Maisonnet, (*Progress Medical*, July 30, 1910), report an interesting case of cerebro-spinal meningitis with autopsy findings. The patient, a soldier who had had double otitis at twelve years of age, had an acute attack of sore throat accompanied by right-sided deafness. Headache, vertigo, rigidity of the neck and Kernig's sign developed. Lumbar puncture showed meningococci and streptococci. Two injections of Dopter's serum were given; then, in order to discover whether the condition was a meningitis due to the otitis, trephining was done, showing the apophysis and antrum to be normal. Death occurred the day after operation. Autopsy showed meningitis circumscribed to the medulla, pons and cerebellum. The condition was evidently not otogenous, but epidemic cerebrospinal meningitis.

Intestinal Antiseptics in the Treatment of Typhoid Fever.—J. Blake White, (*Medical Times*, August, 1910), reports his success with the Woodbridge treatment of typhoid fever. In making the diagnosis he relies upon clinical symptoms and institutes the use of the intestinal antiseptics early, without awaiting a positive Widal reaction. He gives friable tablet triturates of guiacol carbonate, menthol, thymol and eucalyptol, 20 to 30 in 24 hours, each dose to be followed by two or three swallows of pure spring water. He also uses antiseptic mouth washes; but objects to aerated waters at any time during an attack of typhoid fever. In the diet he allows eggs, light meat broths, milk and well boiled cereals, with solid nourishment as early as the patient's condition warrants it.

Affections Simulating Typhoid Fever.—H. F. Lange Ziegel, (*Medical Record*, June 25, 1910), classifies the conditions which may simulate typhoid fever as intestinal sapremia, colon bacillus infections, meat poisoning, paratyphoid fever and Brill disease. The character of the eruption, the severity and duration of the symptoms, the Widal reaction and finding typhoid bacilli in the blood make the diagnosis certain. Brill's disease is regarded as a clinical entity, differing from typhoid in the eruption which appears as a single crop, usually before the seventh day; the rash is profuse, especially on the upper extremities, and sometimes a number of maculopapular lesions from small patches with an indistinct, oval outline. The spots fade, but do not disappear entirely, upon pressure. The disease begins with a chill, severe headache and high fever, which reaches its height in three days, remains high one or two weeks, and falls rapidly with prompt recovery. There is no leucopenia, the blood count being normal. The Widal reaction is negative. Out of Brill's 221 cases no two members of the same family or occupants of the same house were attacked. Three cases of Brill's disease follow, all occurring in Russians.

Treatment.—R. W. Wilcox, (*Interstate Medical Journal*, 1910, page 584), believes that we far too frequently lose sight of the individual in the treatment of typhoid fever. He employs the classification of the disease, recently proposed by Roger, into three groups: (1) according to age, (*a*) children, and (*b*) the aged; (2) according to previous condition of health, (*a*) cachectic (*b*) obese, (*c*) drinkers, and (*d*) tuberculous; and (3) according to the existence of another infection, (*a*) so-called typhoid malaria, (*b*) laryngo-typhoid, and (*c*) pneumonia typhoid. Typhoid fever should never be excluded because of a negative Widal reaction; headache, sleeplessness, pharyngitis, dry yellow palms and albuminuria are valuable aids in diagnosis. In spite of all theoretical objections, vaccination against typhoid fever ought to be practiced. Wilcox prefers therapeutic fasting, not starvation, to the administration of a large amount of milk. The essential part of the feeding in typhoid fever would seem to be a moderate amount of milk, malted milk or milk with a carbonated water, eight ounces four times a day. Substituting albumin water for some of the milk will be of benefit sometimes. Soft boiled egg and custards are advisable. Wilcox objects to alcohol and also to a dimly lighted sickroom. The nurse who has charge of the excreta or anyone who occasionally is engaged in that capacity should have nothing whatever to do in preparing food for others. Cold sponging is the only form of hydrotherapy advised. Wilcox uses compound solution of chlorine, U. S. P., one dram every three hours, diluted in at least two ounces of water, to inhibit bacterial activity. He claims that by this method chlorine can be safely administered without fear of digestive or other disturbance until bacterial activity in the alimentary tract is markedly inhibited. The tongue becomes cleaner and appetite and digestion improve, the fever is lower and the stools are devoid of odor save that due to chlorine. The general health, intellectual processes and nervous conditions improve and the duration of the disease is diminished. He also gives ten grains of hexamethylenamin daily as a matter of routine practice. Hemorrhage is practically unknown under this treatment.

Etiology of Typhoid Fever.—L. L. Lumsden, (*New York Medical Journal*, July 9, 1910), from his experience and a thorough review of the literature, concludes, "that typhoid fever is a disease which is communicable from person to person; that the infective agent is effective immediately upon being discharged from the bodies of diseased persons and that anything which will serve to convey living micro-organisms from the excreta of such diseased persons to the alimentary canals of healthy persons may be a factor in the transmission of the infection; that the most common factors in transmission are personal contact, water, milk, raw fruits and vegetables, raw shellfish, flies and other insects; that the operation of any as yet unknown factor in the transmission of the infection is prevented by the same measures which will prevent the operation of known factors. The factors concerned in the establishment of individual susceptibility are so far undetermined. The typhoid bacillus is an essential, if not the exclusive factor in the production of typhoid fever; in the adoption of practical measures to prevent the disease, this organism should be regarded as the specific infective agent in the causation of typhoid fever."

Causes Determining the Production and Distribution of the Erup-

tion in Typhoid Fever.—J. P. H. Greenhalgh, (*British Medical Journal*, February 19, 1910), believes, "that the inhibition of the vasoconstrictor and other nerves in the reflex zone in thypoid fever is due to the reflex incidence on them of specific impluses originating in the small intestine, mesenteric glands and spleen. The rose spots do not appear until the depression of the vasoconstrictor fibres has become well established and the specific agglutinins in the blood have become demonstrated by the Widal reaction. As the arterioles relax the blood pressure in the terminal capillaries becomes increased and the circulation retarded, probably with some passive dilatation. The influx of a greater volume of blood to the skin in the reflex zone brings a correspondingly greater number of bacilli to the cutaneous capillaries, where the sluggish flow of blood and the impaired resistance of the endothelial cells permit them to loiter, composing themselves into groups wherever possible. This sets up inflammation which becomes visible as the circular, slightly raised rose spot, fading on pressure. Bacteriolysins continue the work begun by the agglutinins and the assembled bacilli are devitalized, dispersed and disintegrated; the point of inflammation subsides and the rose spot fades."

Cholecystitis in a Patient Convalescing from Thypoid Fever.—M. E. Sacquepee, (*Progres Medical*, July 23, 1910), reports the history of a man of 22 years who had had a typical attack of typhoid fever. His temperature became normal on the 25th day and remained normal for 25 days more, when he suddenly had a chill, the temperature reaching 105.2°, with vomiting and subhepatic pain, radiating into the epigastrium and between the shoulders. Tenderness was marked over the region of the gallbladder, with dulness upon percussion. There was no jaundice. The temperature fell in 48 hours, although the other symptoms persisted for three days, the dulness over the gallbladder finally disappearing on the fifth day. Sacquepee comments upon the great abundance of typhoid bacilli found in the blood during the attack of acute abortive cholecystitis, as they had almost disappeared three days before and were not found one week after this complication. He believes that purulent cholecystitis usually occurs in patients who already have gallstones; that it is due to the presence of some other micro-organisms beside typhoid bacilli. He also calls attention to the probability of the future development of gallstones in this patient.

Infant Feeding in Health and Disease

Under the Charge of

MAURICE OLIVER MAGID, M. D.

Adjunct Attending Physician, Yorkville Hospital for Women and Children; Physician Sydenham Hospital Dispensary, Children; Formerly Physician in Charge of Infants Milk Depot of the New York Milk Committee.

The Percentage Method of Infant Feeding.

The Journal of the American Medical Association published a very valuable and explicit paper on the percentage method of infant feeding. Dr. Lowenburg of Philadelphia, the writer of the paper, regards this method of feeding as the best and easiest means of adapting cow's milk to the digestive capacity of the individual infant. The method is rational and scientific and not too intricate or too complex for the general practitioner to adopt. Dr. Lowenburg states that any teaching which claims that it is a matter of importance as to whether the amount of any one constituent varies a one-fourth or one-half of one per cent., one way or the other, is unfounded, as such fine adjustments are not only unimportant but impossible. The first formula is always an experiment and by this method one can easily determine which of the various constituents should be increased or diminished.

The laboratory modification of milk, while theoretically ideal, is most often too impracticable and too expensive. The pediatrist as well as the general practitioner should therefore become familiar with one, or at the most two, methods of milk modification that can under fair home surroundings and with an intelligent mother be performed without much difficulty. Dr. Lowenburg recommends Holt's top-milk method for the majority of cases in private cases and Baner's cream and milk method for institutions and poorer class of private work and dispensary patients.

To meet with success in the percentage method of feeding, the physician must not scorn to teach the mother the importance of details in the preparation, or to show her personally how to make up the first formula and the various milk diluents. Percentage feeding cannot hope to cope with ignorance and squalor met in the home of the slum dweller any more than can aseptic surgery, although there are a number of instances where men have met with success in the slum districts.

In considering the causes of failure with relation to the infant, one must bear in mind that there are some infants who cannot digest cow's milk in any form. Some infants possess an intolerance for fat. In such cases skimmed milk should be modified and given to the infant, or buttermilk containing cooked wheat flour and sugar should be given. Premature infants, rachitic and marasmic patients all present feeding problems different from those of the ordinary healthy bottle-fed baby, and require peculiar delicate manipulations to start them on the road to recovery.

Because of the variance in the digestive power of infants it is difficult to state a general rule for prescribing for all cases. It is to be remembered that when vomiting occurs about one and one-half hours after feeding that fat is not properly digested, especially so when the vomitus is sour and smells like rancid butter. The stools are usually green in color, acid in reaction and contain lumps of undigested fat. Sometimes the stools are constipated, greasy, white and foul. In prescribing, it is best to commence with one per cent. to 1.5 per cent. of fat and gradually increase the amount as tolerance is established, never going beyond 3.5 per cent. in the majority of cases. When it is found that the fat constituent is difficult of digestion, the intolerance may be overcome by pancreatinizing the formula. This process should not be carried on for too long a period, in view of the possibility of rickets and scurvy developing. This process is very valuable especially in asthenic and marasmic cases.

There seems to be a difference in opinion as to the difficulty in the digestibility of protein. Some authorities claim that protein in the milk is not the cause of any trouble and claim great success in the feeding of undiluted milk, while others feel that when one can modify the proteids so that they are easily digested, then the problem of feeding is solved. Whichever may be the right contention, the fact remains that curd indigestion is an existant, troublesome factor. It is therefore of great importance that the possible indigestion and troublesome condition should be prevented. A healthy new-born infant should not receive more than 0.5 per cent. to 0.7 per cent. of combined protein. If this is tolerated, the amount is slowly increased until at six months it receives from 1.5 per cent. to 2.0 per cent. and at the age of from ten months to one year 4.0 per cent. can as a rule be digested. In cases where distinct protein intolerance exists notwithstanding the age of the child, and the stools being curded, green and slimy associated with colic and irritability, or the movements being white, hard and dry, crumbling easily, the initial treatment indicated in such condition is a purgative dose of castor oil followed by whey feeding for a few days. Then paracaesin is gradually added, noting the effect as it is increased. Sometimes it may be necessary to pancreanize the formula for a short time. After this the addition of some efficient digestive ferment to each bottle, or to every other bottle, before feeding is an excellent aid until the digestive functions have been completely established.

To render the curd more digestible, one or two grains of Sodium Citrate may be added, to every ounce of milk and cream in the mixture. Cereal decoctions are also an excellent means of attenuating the curd, rendering the paracaesin easily digestible. The cereal decoctions provide a certain amount of starch which can be digested and assimilated by infants as young as nineteen days (Kerley). Barley water in full strength or diluted with boiled water, boiled water is to be preferred for general use. If constipation is present, use oatmeal water instead. The old fashioned flour ball, baked to bread-brown, grated and added to the amount of one-half ounce to each bottle, just before feeding, is very satisfactory in facilitating protein digestion. Whey will, when used as a diluent to milk, cream or top-milk, render the curd finer and more susceptible to the digestive juices. It must be heated to 150° F. to destroy the action of the ferment. If the whey is heated beyond this point, the lactalbumin will become coagulated.

Sugar rarely causes any trouble with digestion. The new-born infant should receive from four to five per cent. and gradually up to seven per cent.; this continuing up to nine months, when it is gradually reduced to four per cent. at the age of one year. Sugar indigestion manifests itself by frequent watery stools that excoriate the buttocks, vomiting of sour watery material, colic and flatulency. If the amount of sugar in the food is deficient, the infant shows marked wasting and a subnormal temperature. If the infant receives too much sugar and does not show any signs of disagreement, it is fat, flabby and anemic and frequently becomes the victim of scurvy and rickets.

In conclusion Dr. Lowenburg calls attention to the fact that any formula, however accurate in composition and however scientific in its adjustment to the infant's digestive peculiarities, must be regarded as an artificial food. This food, therefore, must be reinforced by those elements which will cause it to approximate Nature's product (mother's milk) in freshness, cleanliness, and antiscorbutic qualities. The finished product should be made from certified milk, should be well iced, and it should never be kept longer than twenty-four hours. By adding 15 grains of Sodium Chloride to each 20 ounces of formula and by giving expressed beef blood, freshly prepared, or orange juice in one-half or one drachm doses between bottles on an emtpy stomach, the infant's nutrition is greatly improved.

Cause of Constipation in Infants.

Dr. E. Pritchard in the May issue of the London Practitioner summarizes the causes of constipation in infants as follows:

A. Organic Impediments to Peristalsis.
  (1) Congenital Malformations,
    (*a*) Atresia recti,
    (*b*) Imperfeorate anus,
    (*c*) Dilated Colon (Hirshprung's Disease),
  (2) Acquired structural alterations,
    (*a*) Dilated, convoluted or lengthened colon from over-feeding or flatulent distention,
    (*b*) Inflammatory conditions of the (*i*) Peritoneum; (*ii*) Bowel Wall; (*iii*) Mucous membrane.
B. Interference With Nervous Mechanism of Peristalsis and Defecation,
  (1) Organic (meningitis, hydrocephalus, tumors of the brain and spinal cord),
  (2) Toxic conditions,
    (*a*) specific infections (fevers, ect.),
    (*b*) specific poisoning due to drugs (opium, lead, excess of lime water, etc.),
    (*c*) intestinal toxemias due to decomposition of food in the bowel,
  (3) Exhaustion of the nervous centers due to over stimulation by:
    (*a*) diarrheas,
    (*b*) purgative drugs,
  (4) Interference with the peripheral nervous mechanism by:
    (*a*) hypersensitiveness of the anal sphincter (fissure of anus),
    (*b*) anasthesia of sensitive zone of rectum (by enemata, suppositories, presence of foreign bodies, etc.),
C. Faults in the Intestinal Contents,
  (1) Insufficient food (starvation, vomiting),

(2) Deficiency of fluid (dehydration of tissues by fevers, loss of blood, want of bile and intestinal secretion).

For the treatment, Dr. Pritchard recommends that in all cases the exiciting cause, such as deficiency or excess of food, or qualitative faults must be treated by appropriate means. The motions may be softened by (*a*) free doses of petroleum emulsion or by (*b*) small doses of drugs which promote intestinal secretion and the outflow of bile.

Inertia of the bowel may be treated by massage, or massage combined with electricity and in aggravated cases by cascara sagrada and nux vomica.

In cases in which chronic colitis complicates the condition, a preliminary course of irrigation may be employed. In cases in which the motion are light colored and offensive, liquor pancreatitus may be added to the petroleum. In all cases the regularity of habit must be enforced by careful and systematic training.

Malnutrition in Infancy.—Drs. I. J. Tint and L. Breskman have made a study of malnutrition in infancy and its relation to the gastric digestion and have reported the following conclusions in the New York Medical Journal:

(1) That in the examination of the gastric contents of eleven children mostly under one year of age, having no vomiting or green stools, they found a constant presence of free hydrochloric acid, rennin and pepsin.

(2) That similar examination of twenty children, under one year of age, having green stools, vomiting and a gradual loss of weight showed an absence of free hydrochloric acid, rennin, and pepsin.

(3) That in well developed cases of malnutrition, absence of gastric inactivity was constant.

The authors believe that in very early life, the stomach plays an important role in digestion through its peptic and rennin activities; that free hydrochloric acid is normally present and that with the onset of green stools in artifically fed or breast fed children there is an absence of free hydrochloric acid.

An Uunsual Case of Congential Absence of Anus and Lower End of Rectum.—Joseph Wiener, New York, tells of a new-born infant, in whom there was absence of anus and lower part of rectum; an immediate operation, by incision of the perineum, with pushing down of the closed pouch of rectum, and suture, saved the life of the infant.—*Medical Record.* August 6, 1910.

Diseases of the Skin and Uro-Genital System.

Under the Charge of

EBERHARD WILLIAM DITTRICH, M. D.

Instructor in Diseases of the Skin, New York Post Graduate Medical School and Hospital; Assistant Dermatologist O. P. D., Lebanon Hospital, New York.

Two Cases of Chronic Superficial Macular Dermatitis with Symmetrical Localization.—H. G. Adamson, Transactions of the Royal Society of Medicine, Vol. III., No. 6, presents two children of four and twelve years respectively, with chronic superficial macular dermatitis with symmetrical localization. On first sight one might confound it with Lichen scrofulosorum. Histological examination, however, shows minute vesicles, originating in the horny layer of the epidermis. They dry into crusts without pus formation. There is no itching nor are there any subjective symptoms present. The lesions are is recalcitrant and cannot be influenced by any known therapy. Although there is some similarity to the eczema scrofulosorum, as described by Boeck no relation to a tuberculous diathesis could be demonstrated.

Influence of Roentgen Therapy on Pruritus and Prurigolevis, of Children.—Terzaghi, (*Clinica dermatosifilopatica della Universita di Roma*, 28 Jan.,10). The author treated the cases in such manner, that one-half of the so-called erythema-dose was applied to every affected part. If this did not prove sufficient, the application was repeated after 12 to 14 days. While at first the pruritus was increased, it soon ceased entirely. No relapses have occurred.

The Trichophyton Tousuraus in Children, its Distribution, Importance and Treatment.—(*Lancet*, Jan. 1, 1910). Two skin specialists were engaged by the London Lancet, in order to determine the frequency of trichophyton capitis and the most favorite mode of treatment.

They estimated that at least 5000 children in London were affected with this malady, the disease increasing at the rate of at least 1000 a year.

The only method of treatment employed in their researches was Epilation with the X-ray. The X-rays also proved to be very efficacious in the treatment of favus. A special school in the East of London in 1905 for children affected with favus. The attendance in 1906 was 61. The Roentgen therapy cured all children excepting three within one year, so that the school could be closed.

Different techniques are in use in the various hospitals and are worth while reading up in the original. The "method of five exposures without protective covering" seems to be the most effective one.

Many parents however object to this manner of treatment owing to the statement made by Dr. Turner, Edinburgh, that the rays have a deleterious effect on the brain.

Reaction of the Skin in Childhood.—S. Beck-Budapest, (*Gyemetkoroos Budapesti Orvosi Ysag*, 1909, No. 4). Individual disposition plays an importtant part in the genesis and the clinical course of certain skin diseases in infancy and childhood. The ordinary diseases of childhood seem to predispose to certain dermatoses. While over-feeding is thought to be the cause of an eczematous diathesis, rickets will favor the development of skin eruptions of the prurigo group. It is a well known fact, that we often observe after scarlatina, measles and vaccination new skin lesion, which have no etiological connection with the original disease, most frequently prurigo and eczema, psoriasis being of rarer occurrence.

The author cites 50 cases from the Adele-Brody Hospital, which seem to prove that the body shows a peculiar inclination for the invasion of the tubercle bacillus after measles. There is also after-infectious diseases a predisposition to other diseases, which are not thought to be of bacterial origin. In a little girl of three years varicella was complicated after a few days by an eruption, which not only displaced the new varicella lesions, but also occurred at the site of the still adherent crusts—a perakeratosis psoriasiformis.

The author also collected 30 cases with various forms of erythema and urticaria. In four of these he observed eczema in one psoriasis at the site of vaccination. In these instances the complication became generalized. Lichen urticatus occurred in some instances, but was considered to be due to intestinal disturbance, and not to be caused by the original disease.

Rectal Gonnorrhea in Children.—Karumheimer, (*Muncheuer Med. Wochenschrift*). In a 21 months old child gonnorrhea of the rectum was diagnosed and cured in four months with the injections of thyrosol and albargin.

Swelling and purulent discharge together with the presence of the gonococcus were the chief manifestations. Gonococci were also demonstrated in another case, in which the mucous membrane of the rectum appeared to be normal. In both cases there was a primary gonorrhea of the vulva. The infection of the rectum had been produced either by overflowing of the secretion or by taking the temperature by rectum. This procedure should be discountenanced in like cases.

Special attention should be given to the possibility of rectal infection, as it is not impossible that it would prove to be the source of reinfection of the vulva. Especially in hospitals endemics this may prove to be the causa nocens.

Alopecia in a Young Child with Acquired Syphilis.—Dr. Eberhard W. Dittrich, (*The Post Graduate*, May, 1910). R. G., three years of age. N. S. well developed but somewhat anemic. He showed the following conditions; there were small spots of complete baldness, generally distributed all over the scalp. The eyebrows had disappeared and the eyelashes were falling out. There were small scaly spots of brown color all over the body. A large indurated, pigmented, tumor-like mass with central depression and scar formation on the lower third of the left leg. Mucous patches were present on the anus and in the throat. The cervical and epinicdyloid glands were enlarged. The diagnosis of acquired syphilis was made and borne out by the history, obtained from the mother. It was established beyond any doubt that the above described lesion on the left leg was the site of the primary sore. Under daily inunctions of oleate of mercury the lesions disappeared and in a short time the hair returned.

Addison's Disease in the Infant.—(*Le Journal de Medicine de Chirurgie*, Montreal, March 22, 1910). Dr. Mademoiselle S. Finklestein reviews the subject of Addison's disease in infancy, giving the observation of 10 cases, made during the last 10 years. While she found that tuberculous affection of the suprarenal capsules was present in the majority of cases, there were also cases in which these lesions were not formed. She also states that Addison's disease is most prevalent between the ages of 12 to 15 years, although it may appear at any age.

The symptoms, asthenia, melenodermia, diarrhea and vomiting are observed in children as in adults. Pain as a rule is very slight.

Convulsions are frequent in children immediately before death, sometimes choreiform in type.

Pigmentation is rarely seen on the conjunctiva and nails. The blood pressure is lowered, the pulse being feeble and rapid. The disease usually takes a fatal course, the fatal termination being hastened by the complicating miliary tuberculosis. Complications of acute infectious diseases will render the prognosis very grave. In very young infants severe and prolonged gastrointestinal catarrh may bring about a bronzing of the skin, which might lead to an error in diagnosis. The suprarenal extract of mutton has been used in the treatment of this condition with varied but doubtful results.

Notes on the Cutaneous Reaction of Von Pirquet in the Diagnosis of Tuberculosis.—Elliot A. Brummit, M. B., (*Adelaide Australasian Medical Gazette*, Sydney, Jan. 20, 1910). Dr. Brummit applied the von Pirquet test to 73 children and found a positive section in 24.

Usually within 24 hours a red swelling appeared over the scratched area and there was an area of redness surrounding the swelling. The swelling and redness increased a little for two to five days and then subsided with slight desquamation. The temperature was not affected and there was no pain connected with it at any stage of the proceeding.

In eight cases the test was repeated once or more and the same result obtained in each instance, excepting that the eruption was vesicular in three positive cases.

The tests were either definitely negative or positive in all cases. It is easy to apply and is thought by the author to be of value in early diagnosis of tuberculosis, especially in children.

Disorders of Metabolism, Growth and Nutrition.

Under the Charge of

JESSE G. M. BULLOWA, A. B., M. D.

Lecturer on Clinical Medicine, New York Polyclinic Medical School and Hospital.

Hypo Thyroidism in Children.—(*W. Hoeltvner Jarbuch f. Kinderheilkunde*, IXXII, No. 2, Pg. 121). In children myxoedema is frequently mistaken for rachitis and the prognosis is more serious if there is neglect of early treatment. This is especially true of the incipient or rudimentary types of the disease. A boy of six years had not grown in two years but was otherwise normal, although not particularly bright. Under thyroid treatment he grew 11 cm. in 18 months. In two cases myxoedema developed, after severe measles or mumps. In the latter case with symptoms of acute thyroiditis. The thyroid treatment ordered by the physician was stopped by the family and pronounced myxoedema developed, but subsided spontaneously in two years. In a fourth case the myxoedema developed after a severe fall over a balustrade, the throat in front bleeding from the injury. This is probably the first case of traumatic myxoedema on record. Cure followed thyroid treatment. Pasty, fat, pale and flabby children require thyroid feeding, as they may be suffering from thyroid deficiency. Over-feeding such children seems to lead to lymphatic enlargement.

Calcium and Spasmaphilia.—J. Rosenstern, (*Jarhbuch f. Kinderheilkinde*, Aug., LXXII, No. 2). Deficient lime in the food seems to cause nervous over excitability. This nervous excitability was materially reduced in 15 out of 20 infants after the exhibition of 100 c.c. of a three per cent. solute of calcuim chlorid. A solution of sodium chlorid seemed to have a reverse effect. The infants treated were between four and fourteen months and inclined to dyspeptic disturbances. Rosenstern advises the use of calcuim chlorid as a means of treating an acute attack of threatened convulsions in a child. It was concluded that this was a case of incomplete heat production. Analogous to the hibernating state in some animals.

Continued Subnormal Temperature in Infancy.—Henry W. Cheney, (*Journal A. M.*, Vol. L. No. 10, Pg. 822). A Three months old girl was breast fed for three weeks and later fed on malted milk and condensed milk. She weighed at one month, five and three-quarter pounds. She began to waste until on admission to the hospital her weight was one and one-quarter pounds. Gastro intestinal indigestion was treated by colon flushing and diet. The infant under observation for five months rarely had a temperature that reached 98° F. Once it reached 89° F. Daily inunctions of mercury for two weeks caused no improvement. Whiskey seemed to cause the temperature to fall lower and external heat in the form of hot water bottles was of no avail.

Action of Thyreoidin Tablets in the Normal Growth of Bone.—E. Bircher, (*Kant. Versuchsanst Aarde Arch. Klin. Chir.* 91–554). The thyroid glands were removed from six rats from same litter—the three of those fed thyroid in tablets showed more rapid formation of bone, particularly a hastening of calcification. This was confirmed by roentgengraphy. The bearing of these experiments on Cretenism is discussed.

Suprarenals and Rachitis.—A. Iovane and C. Pace, (*La Pediat.* 17, 195–217). Adrenalin O.1–1 nig. injected into rachitic children, increase muscular tone, appetite and metabolism. From experiments on dogs and rabbits, however the conclusion is reached that there is no connection between the suprarenals and rachitis.

Thyroid Weakens Hunger for Sugar.—A. Siegmund, *Deutsch Med. Wochenschrift*, No. 36, pp. 990–1). Several children who had subsisted on sugar and chocolate were fed thyroid. An increase of weight and strength followed.

Surgical Diseases of Childhood.

Under the Charge of

WILLIAM A. EDWARDS, M. D.

Professor of Pediatrics, University of California, Los Angeles, Cal.

Treatment of Hernia in Children.—For more than sixty years we have known that infantile hernia have a tendency to disappear of themselves in a large percentage of cases. Malgigne who first called attention to this also stated, and the statement is correct, that there is one hernia in every twenty-one children during the first year of life, and that this proportion holds up to the sixth year of life when a decrease occurs so that at the age of thirteen the ratio is 1.77.

Seventy-five per cent. of all hernia heal spontaneously before the child has reached twelve to thirteen years of age. More will heal if proper conditions are secured. Shuttleworth, (*The Canadian Journal of Medicine and Surgery*, Toronto, April, 1910), thinks that the habit of applying a tight abdominal binder during infancy predisposes to the formation of hernia.

Much more important however, is the hereditary tendency or defect and most important is the factor of intra-abdominal pressure. This may be due to habitual constipation, requiring great straining during defecation; phimosis, causing strain during micturition; severe coughing, and lastly, intestinal disturbances from unsuitable food, resulting in flatulency and indigestion which causes pain and crying and constant rise in the intra-abdominal pressure.

Congenital Inguinal, or Femoral Hernia, is rare in females, though the umbilical variety is common and is readily cured in both sexes by simple means.

Strangulation is rare in infancy and young children.

The singular tendency in female babies to the escape of the pelvic organs of generation through the canal of Nuck is noted.

A truss on a diapered infant is a great nuisance. Difficult to keep clean and hard to fit. The best treatment is to place the child in bed for about six weeks. The lower end of the bed to be elevated to an average 20 to 30 degrees from the floor. Do not carry the child, the mother is to nurse it by leaning over the crib. Coughs, constipation and phymosis should be cured, and gaseous distention of the bowels should not be permitted to arise.

Among the poor, the writer of the above article, Shuttleworth, has had ample opportunity of judging from extensive experience gained at the outpatient department of the Hospital for Sick Children, Toronto, the treatment of infantile hernia is very unsatisfactory. It is almost impossible to have the parents carry out the instructions given and particularly when a truss is advised. All forms of retentive apparatus, fitted with every care have been tried, but with very indifferent results.

It is practically impossible to treat the large numbers of these patients by the rest cure in the hospital on account of limited accommodation. In private practice the results have been very satisfactory indeed. If a properly fitting truss which perfectly controls the protrusion, be worn night and day. for at least six months, and precautions taken to guard against increased intra-abdominal pressure from any cause whatever, the prospects of cure in infants, are good.

Operation is indicated only in strangulated hernia, in irreducible hernia and in very large hernia which a truss will not hold. In the two former classes all that is necessary is the operation devised by Mitchell Banks which consists in simple dissecting out the sac to return within the abdominal cavity and closing the wound in the skin. In large hernia, one of the classical and well tested procedures, such as Bassini's should be adopted.

Carcinoma of the Stomach in a Boy of Fourteen.—A case of carcinoma of the stomach in a boy aged fourteen years and nine months. Ness and Teacher record this unique case in the *British Journal of Children's Diseases*, Vol. V, No. 12, 1909, in which an exploratory laparotomy was done and the patient died nine days later. A post mortem showed in the lesser curvature of the stomach a short distance from the pylorus an ulcer about three millimeters in diameter; circular in outline with thick edges. It appeared to be a simple chronic ulcer, but there was an unusual degree of thickening of its margins and a considerable area of stomach wall around it is also thickened and extremely hard. White hard masses extend from the outside of this area to the liver and gall bladder, there are numerous small white nodules in the peritoneal coat and the gastric-colic omentum is full of similar nodules. There was a distinct stricture opposite the ulcer. Microscopic examination showed the tumor to be a scirrhus carcinoma, showing throughout an extreme degree of fibrosis of the stroma and atrophy of the epithelial elements. The latter for the most part, are small, solid processes of polygonal cells: but in some of the younger secondary tumors an acinous arrangement was seen. Histologically the growth was quite characteristically gastric carcinoma. From the condition of the mesentery it could be definitely stated that the nodules along the intestine were secondary and produced by lymphatic permeation.

The chief interest in the case lies in the occurrence of carcinoma of the stomach in a person so young. In the analysis of Osler and McCrea the youngest was twenty-two years. In fact, only three or four per cent. of cases occur below the age of thirty years. When their book was published there were only six cases below the age of ten years on record.

Open Operation for Congenital Luxation of the Femur.—B. M. Ricketts, M. D., states in the *New York Medical Journal*, June 4, 1910, that he is in favor of the open operation because the dangers of fracture hemorrhage, tetanus, paralysis and shock incident to the unopen method are all avoided. This method is applicable to all cases of three years or older. It seems that the percentage of imperfect results, that is, redislocation, ankylosis, shortening and pendant member are no greater in the open method.

As the operator elects one or both heads may or may not be removed, or the head may be held in place by a screw or nail or by an osteoplastic flap as suggested by Furguson.

It is well to maintain the prone position for one hundred days or more, then the erect position with crutches and an elevated shoe on the sound side. At the expiration of one hundred and twenty-five days antero-posterior motion of the artificial joint may be commenced.

At the one hundred and fiftieth day the body weight may rest upon the afflicted limb.

In bilateral artificial joints with or without the absence of the heads extension braces may be used with advantage.

BOOK REVIEW.

The Child, a new monthly journal devoted to Child Welfare, will appear in the early autumn. Dr. T. N. Kelynack has undertaken the editorial oversight, and will be assisted by a thoroughly representative staff of medical, educational and philanthropic experts.

The journal will be suited to the requirements of all engaged in Child Study or working for the betterment of Child Life. The first number contains communications from Dr. H. T. Ashby, Dr. Bertram Thornton, and others. Such a list affords ample evidence of the authoritative character of this forthcoming journal.

In order that *The Child* may serve all interests working for Child betterment, the publishers are arranging to issue with each number a *Directory* of Schools and other educational establishments; also of Societies dealing with all forms of Child Welfare, and of hospitals, orphanages and like institutions for Children. Heads of Schools and Secretaries of Hospitals for Children and similar public institutions should communicate at once with the publishers. *The Child* is clearly a publication which no friend of the children can afford to neglect. The publishers are Messrs. John Bale, Sons and Danielsson, Ltd., 83–91, Great Titchfield Street, Oxford Street, London, W.

PEDIATRICS

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EDITORIAL

THE EFFECTS OF PARENTAL INFLUENCES UPON THE UNBORN CHILD.

It is an indisputable fact that in the ruling and guiding of this world nothing is left to chance, everything is subject to system, and everything that is not scientific is unworthy of consideration. But what about child engenics? Science has been applied for the better production of cattle, horses, dogs, and hens have been made more productive. The breeding of race horses, fighting cocks, and bull dogs is scientifically and systematically studied, while scarcely no attention is given to laws governing the production of child life in all the world around us.

A limited few of the more intelligent have grasped the thought—and may it spread—that to procreate a human being after God's own image, in love and purity, is the child's first right which is the greatest and best gift, that parents may bequeath to the world; but the great mass of our population is in the deepest and darkest ignorance concerning procreation, and their offspring are fit products of this ignorance of child engenics.

The great majority of children are brought into this world through selfish or thoughtless indulgence of erotic desire either in ignorance or in defiance of nature's laws on the part of one or both concerned. The mental, moral or physical fitness for this function has never been properly considered for the proper scientific procreation of the human species. The laws of this country permit marriage between syphilitics, consumptives, criminals, inebriates and the mentally unfit, all of which demands a tribute upon the body politic.

During the first ninety days of uterine life is the period of time when the foetus is most susceptible of maternal impression, physical, mental and spiritual. The brain and spinal cord take precedence in the order of development, therefore the prospective mother should be surrounded with pleasing environments beautiful scenery, agreeable and loving companions, and avoid all unsightly, unpleasant and disagreeable objects, persons, thoughts or things, since anger, fear and disgust, sorrow and enmity all create poisons in the blood, which effect, more or less, the growth and development of the nervous system of the foetus. Gates reported, as long ago as 1879 that Rhodopsin had shown that the breath of a patient condensed and precipitated gave various results according to the mental state of the individual and concluded as follows: "Emotions generate in the system compounds that are injurious or nutritious, according to their nature."

Anger has been known to so poison the system as to produce extreme mental and physical depression or even death; while joy, love and happiness give a stimulant and nutritive effect, which often exerts even remarkable endurance. We all know that if a mother is overworked or improperly nourished before conception, during gestation, or during lactation that the health of the mother and the vitality of the child suffer. Is it any wonder, therefore, that infant mortality is so great, or that if perchance the child survive that it is a failure for life? The pity of it all is that the majority of mothers do not know what they are doing. The only remedy for bettering this condition is to teach the laws governing procreation and child engenics.

LETTER AMBLYOPIA AND LETTER-WORD AMBLYOPIA

In April, 1910, Dr. J. Herbert Claiborne of New York read a paper before the National Association for the study and education of exceptional children,* in which he dealt with this subject, reporting cases of "letter-blindness." The author heartily commends the present methods of instruction employed in our public schools which are of particular advantage for those cases in which there is letter amblyopia and letter-word amblyopia.

He refers to the method by which children are taught to read by looking at words and recognizing them as a whole. A child who can differentiate T from Z would certainly learn to differentiate the word "lake" from "dog" for example, and call them correctly, since they have no resemblance whatever to each other. Whereas, by the old method of instruction of teaching letters first, it would be impossible to teach these children who are letter amblyopic to read these words.

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*American Journal of Obstetrics and Diseases of Women and Children.

"As is well known" says Dr. Claiborne, "the left side of the brain controls speech in those who are right-handed; and the right side of the brain in those who are left-handed. It therefore occurred to me as a method of treating these children who are symbol amblyopic, and that they should have their 'dexterity' reversed as I have described it, that is to say, at as early an age as possible those who are right-handed and symbol amblyopic should be trained to left-handedness, and vice versa, so that the speech center is reversed in each case from one side of the brain to the other, and one side so educated that it takes command or supplements the other."

Dr. Claiborne has carried out this idea of reversing dexterity into a field, which, though closely allied to word blindness, is somewhat different from that unfortunate defect of speech known as *stuttering*. He conceived the idea that stuttering is due to a congenital defect somewhere in the neighborhood of the speech centre, and that lack of co-ordination, which characterizes this defect, is the result of imperfect cell development in the brain.

His suggestion was based mainly upon the study of his own son, who was naturally left-handed and who was taught French first; he learned speech as readily and as rapidly as most children, but after he commenced to speak well enough to attract the attention of others, his mother determined to change his left-handedness into right-handedness, and so constantly corrected him. It was observed that as soon as he used his right hand for some time and had acquired some ease with it, he commenced to stutter. His parents persisted, however, in making him right-handed and after several months caused him to be habitually so. In proportion as his right hand became more dextrous his stuttering diminished and now, having acquired perfect ease of his right hand, he has ceased stuttering entirely. It required between twelve and eighteen months to produce this effect. At this time he is eight years of age and occasionally uses his left hand and seems to prefer it, but uses his right hand habitually.

WORD BLINDNESS.

A writer in the *London Lancet* draws an interesting and practical distinction between true word blindness and what he terms pseudo word blindness. In the former the patient is unable to recognize words that are in his vocabulary, in the latter he fails to recognize words because they are not in his vocabulary, which in some cases is extremely restricted. Such cases are best treated by placing the child in classes where he will hear a maximum of talking, reading and word building, to the end that the limited vocabulary may be increased, and the defective ear memory which always complicates pseudo word blindness may be trained to more effective service. The difficulties which beset a child afflicted with pseudo word blindness may be estimated if we note the difference in the process which occurs when a normal child reads a new word and when th pseudo word blind children reads it. For instance, when the normal child sees the word "frog" in print for the first time, and pronounces it as his training in word building enables him to do so, he at once associates the appearance of the word with the spoken word which is already familiar, and also with the animal itself. The pseudo word blind child, on the contrary, does not associate the printed word either with a sound familiar or with any object.

Naturally when the vocabulary is defective, spontaneous speech must suffer, and all the more because phrases, those "memorized permutations of words," which are the common coin of conversation, are also lacking, and the child suffers from restricted phraseology as well as from a defective vocabulary. As a consequence he feels himself at a disadvantage among other children and tends to avoid them and shut himself up in himself, a course which naturally aggravates the very condition which occasions it.

Obviously, it is both useless and cruel to put such a child in a reading class until his vocabulary and phraseology have been trained up to a point approximating the normal. This must be done by "filling his mind with intelligent speech." To this end the co-operation of the child's parents should be enlisted, and the nature of his defect and its proper treatment carefully explained to them. When sufficient improvement has been secured to enable the child to go into the reading class without losing confidence, he should go over beforehand what he is to read, checking the words which he has to spell out, and then go over these repeatedly again removed from their context by means of an "isolator," a disk with an oblong opening in it.

By patiently following out these methods, a child may be brought up to normal standards, who, by a little misunderstanding and neglect could have easily have been relegated to the ranks of the distinctly defective.

True word blindness the author believes to be excessively rare, and the keynote to its treatment is repetition, the isolator proving of service also in this variety of the affliction.

EFFECTS OF ALCOHOLIC DRINKS ON CHILDREN.

A matter of diet which we designedly postpone, is the effect of alcoholic drinks in childhood. The younger the child the more harm they do. The most exaggerated examples of cirrhosis are to be found in youth, and sometimes from alcohol. The administration of strong drink, even in the most injurious form of distilled spirit, to children of tender years, is by no means unknown among the lower classes. The irritant effect is most declared upon young tissues, and necessarily upon the liver next after the stomach, according to the course of the circulation. Hence the overgrowth of fibrous tissue which constitutes the disease is, in these circumstances, luxuriant, and great the nodulation, and obvious the transformation of the organ which ensue. We could refer to these instances of cirrhosis from this cause, one which proved fatal at the age of eleven years, one at seven, and one, we think, somewhat younger. In all these cases the liquor was spirit.

DEATH OF A CALF FROM FEEDING ON BOILED MILK.

Not long since, I read the statement, that boiled milk fed to a young calf (one day old) and continued for a period of one week, would cause the death of the calf from diarrhea. If any reader of *Pediatrics*, saw this statement and will communicate with the Editor giving the source of the statement referred to it will be greatly appreciated.—Editor of *Pediatrics*, 320 Manhattan Ave., New York City.

PEDIATRICS

ORIGINAL ARTICLES

THE CONSERVATIVE TREATMENT OF TUBERCULOUS CRIPPLES.*

H. J. GAUVAIN, M. A., B. C., Cantab., M. R. C. S., Eng., L. R. C. P. Lond.

Medical Superintendent, Lord Mayor Treloar Cripples' Hospital and College, Alton, Hants.

The problem of the tuberculous cripple is one which should engage alike the attention of the surgeon and the educationalist and the assistance and co-operation of the state and the philanthropist. The problem is by no means a simple one. Many factors must be considered before deciding what means can best be employed for the amelioration of any particular case, and co-operative treatment is essential if results which should be most beneficial to the patient and least costly to the state are to be obtained. I propose in this brief paper to particularly refer to the aid the surgeon can give, more by patient, long continued, logical treatment than by the employment of radical measures, and will only in the briefest manner touch upon the assistance which must be obtained from other sources.

From the medical aspect the treatment of the tuberculous cripple should follow the indications which pathological observations and clinical experience alike proclaim most beneficial. It is therefore necessary to grasp the nature of the tuberculous process which is crippling the patient. At first, when the identity of the disease was not understood, and tuberculous inflammation of the bones was confounded with other conditions causing bony deformity, treatment was almost futile. Later, from the combined researches of bacteriologists and clinicians, a clearer conception of the tuberculous process was evolved, and tuberculous bony disease was removed from the chaos of other chronic bony diseases, because clearly defined, and took its proper place. A tuberculome theory arose, and from it was deduced a treatment which appeared a rational one. Tuberculous lesions were considered of such a nature as to be best treated by their complete removal. This treatment involved, as is well known, those extensive operations which were previously so much in vogue, and which by their nature frequently produced such extreme mutilation and such evil secondary results that they are now by most surgeons abandoned. Few operations have yet been devised by which tuberculous disease affecting a large area can be safely and successfully removed, and extensive operations on the spine and hip designed to remove the disease are now, happily, very rarely attempted.

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*Read before B. M. Association (seventy-eighth annual meeting), London, Eng., July 23rd to 28th, 1910.

There is, however, still too much radical treatment employed, and too little is left to those powers in the organism which, when properly brought into play, themselves may combat and overcome the disease. A tuberculous lesion commonly evokes a reaction. There is the production of a zone of resistance about the focus of the disease by the formation of fibrous tissue which encysts, limits, and tends to prevent the progress of invasion. Thus the issue is the result of two opposing forces—the disease which attacks the organism, and the reaction which this attack provokes. It appears reasonable to reinforce this natural defence and diminish the virulence of the attack of the bacillus, limiting in this way its progress.

In very localized and easily accessible lesions total removal of the disease is both justifiable and logical, notably so in disease of the tarsal or metatarsal bones. When, however, the lesions are more extensive and many vertebrae are involved, as in spinal caries, or a large joint such as the hip is implicated, then radical methods can only be employed with the knowledge that the ultimate prognosis is utterly unsatisfactory. It is probable that very few realize how bad the ultimate results of major operations for this disease are, for if the extremely serious final results were thoroughly grasped, then radical treatment would only be undertaken in very limited and specially selected cases.

In the treatment of the tuberculous cripple every means should be employed to enable the patient himself to overcome the disease with which he is attacked, and the least mutilation will eventually in most cases be productive of the best functional results.

This leads me to the consideration of conservative treatment, and of primary importance in the economical and practical application of conservative measures is the recognition that they should be conducted in large, specially equipped and specially staffed institutions devoted entirely to this work. Such institutions must be situated in a healthy locality, either at the seaside or in the country. They must be managed by medical men prepared to devote their whole time to this work, for the work is of a special, tedious and exacting nature, which requires long training and close attention. I believe only one institution in this country meets the requirements of these patients fully and completely, and that is the special hospital at Alton, founded in 1908 by the foresight and energy of Sir William Treloar, where now 270 patients are under treatment.

The conservative treatment of tuberculous cripples may be summed up under two heads:

1. The employment of those general measures now so well understood, which will increase the patient's resistance, namely, open air treatment, combined with administration of ample and easily digested food, and where necessary the exhibition of those tonics and drugs which experience has shown have, if not a specific, at any rate a beneficial effect on the tuberculous child. In fact, all general measures which will improve the patient's resistance and so enable him to himself make the whole fight against the disease should be adopted. But while these measures are of great importance, of greater importance still is the proper application of—

2. Local treatment designed specifically for each individual case. A tuberculous lesion is an inflammatory lesion, and those principles which govern the treatment of inflammation from other causes especially hold good in the treatment of inflammation caused by the tubercle bacillus. Rest is of primary value, and absolute rest should be enforced if the best results are to be obtained. The affected part must be completely immobilized, and this immobilization consistently carried out for a long period under the best hygienic conditions. Not only must this immobilization be insisted upon to ensure the arrest of the disease but also to prevent the onset of deformity, and where possible, if deformity exists, that should be corrected Each case is a law unto itself, and no one method or appliance should be adopted blindly for every case, but, the general principles being grasped,

special means of applying these principles adopted for every lesion.

I propose here to briefly show you those forms of apparatus which in my hands have been most useful in securing the best results in spinal caries.

I choose spinal caries because it is perhaps the most severe and also perhaps the most common form of tuberculous bony disease which exists. While the disease is active the patient is kept recumbent, but mere recumbency does not by any means ensure rest; and not only is the patient recumbent, but he is also immobilized, and immobilized in that position which will prevent deformity. For this purpose I use a board which has been in use for a long time at Berck-sur-Mer, but which I have modified in various ways, and now employ largely at Alton. The use of this board combined with the jacket attached ensures that the patient is immobilized. Properly adjusted, it hyperextends the spine of the patient to such an extent that the spasm of the muscles about the spine is gradually diminished, and the increase of the deformity arrested; and that deformity which is due to muscular spasm may thus be corrected. Muscular spasm, which is so well recognized as producing deformity in other joints, is often almost ignored in cases of spinal caries, and yet, in my opinion there is no factor which is so productive of deformity in spinal caries as muscular spasm about the inflamed focus of disease.

While this board answers all necessary requisites, yet it has some defects—inasmuch as the patient has to be constantly liberated for hygienic reasons, and for the prevention of bedsores, and to overcome this defect I have designed a splint which is made specially for each patient, and adapted to meet his individual requirements. When applied it will be seen that the necessary attention can be given to his back without in any way allowing any movement of his spine, and at the same time progressive hyperextension can be obtained by properly padding the splint, as from time to time may be indicated. Various modifications of this splint will be suggested for particular cases. When as much deformity has been corrected as is possible, and when the disease is not only active but apparently arrested, then the child is immobilized in some form of jacket which will act as an exo-skeleton, and relieve completely the pressure on the injured point. No form of jacket is more suitable for this purpose than a plaster jacket, if properly applied. On the screen I shall demonstrate the application of such a jacket, and you will see from the slides that not only is adequate support obtained, but the functions of respiration and digestion can proceed unimpaired. When evidence is obtained that not only is the disease arrested, but that repair has taken place about the site of the lesion, the permanent support of the plaster jacket may be discarded, and a light removal splint substituted in its place, and later worn only when the patient is walking about.

These methods being rigorously adopted, it can be definitely stated that the onset of angular curvature as the result of spinal caries is an absolute impossibility; that deformity when it already exists, can often to a considerable extent be corrected; and, further, that that deformity which cannot be corrected may be rendered less perceptible by the production of compensatory curves in the spinal column, or, rather, in that part of it which remains unaffected.

There is one point in the treatment of these tuberculous lesions to which I would call special attention, and that is of abscess formation complicating tuberculous bony disease. Abscess formation occurs in a very large percentage of cases, and, when dealt with by ordinary radical methods, only too commonly leads to sinus formation. With the formation of a sinus the prognosis becomes exceedingly grave, and in quite a number of cases the sinuses will never heal, no matter what treatment be adopted. That radical treatment of a tuberculous abscess should be so common is to be deplored when other methods which are capable of application to nearly every abscess, and which will reduce the risk of sinus formation, are available. Quite often adequate immobilization under good hygienic conditions will so modify the abscess that it will not only not increase but become spontaneously absorbed. Should absorption not take place, then aspiration should be performed in preference to incision. I have practised this method of treatment now in very many cases with consistently good results.*

I must now just briefly allude to the education of the patient while under treatment. This is a point which is almost always neglected in ordinary hospitals, where, indeed, these

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*Calve and Gauvain: The Treatment of Tuberculous Abscesses of Bony Origin by Conservation Measures, *Lancet*, March 5th, 1910.

children should, in my opinion, only be admitted for diagnosis and demonstration, and not for prolonged treatment.

The education of the tuberculous cripple should go hand in hand with his treatment. It should be conducted entirely under medical supervision, and when wisely applied will be an aid to treatment, by stimulating the child's interest and removing him from the lethargic and ignorant condition into which these patients so commonly drift. Already means have been adopted for the education of the tuberculous cripple in at least one special hospital in London. I refer to the Alexandra Hospital for Diseases of the Hip where specially trained teachers are delegated to this task. But this method of dealing with the problem does not appear to me to be altogether satisfactory, and is certainly costly. Teachers specially trained for this work cannot hope to earn their livelihood by other means, and therefore the training required and the prospects in front of them make the salary which they receive necessarily a relatively high and indeed in many case a prohibitive one. In my opinion much better results may be obtained by entrusting the education of these children to the nurses who are in constant contact with them, and who, while being trained to nurse, should also be trained to teach the crippled child. The nurse in charge has a much greater sympathy with the patient and greater knowledge of the disease from which he is suffering than could a woman who has no training as a nurse and no acquaintance with the duties which a nurse has to perform.

I believe the difficulties encountered in endeavoring to secure the education of tuberculous cripples will be overcome by entrusting their education to specially selected nurses, trained to teach the child simultaneously with their training to nurse the patient.

The technical training for older cripples is another branch of their education of the highest importance, and, if properly undertaken, most hopeful in its results. It must be dictated by very many considerations, and cannot be dealt with in the short time at my disposal.

Discussion: Mr. W. B. Parsons (London), was glad to hear that the principles of immobilization and hyperextension of the spine in the treatment of spinal caries were being recognized as a necessary part of treatment. These principles had been carried out for the last seventy-five years in London, at the City Orthopedic Hospital, by means of an apparatus in which half-tempered steel was used so as to allow of rapid and easy alteration of adjustment of the appliance. By this method deformity was to a great extent prevented, as exemplified in the case published by the late Mr. Noble Smith, in which a specimen was described and figured showing deposit of new bone in the spine to take the place of that lost by caries. Although a great advance had taken place in the technique of application of plaster-of-Paris, he doubted if the disadvantages of it as a spinal jacket would ever be overcome; nor was this necessary, since so many equally effectual methods of obtaining immobilization and extension were now in use.

PYLORIC STENOSIS IN THE INFANT.*

BY

W. D. HAINES, M. D.

Cincinnati.

Pyloric stenosis in the adult is usually due to one of two conditions, cancer or its precursor, ulcer, but in infants we sometimes meet a form of stenosis which was present at birth, or became manifest a few days after the birth of the child.

Of the numerous theories advanced to explain the symptomatology of pyloric stenosis in the infant, but three appeal to one as having a rational standing, and it is perhaps to a confusion of these theories that we are indebted for our present discord anent the pathology of this malady. The three most plausible theories in the production of this pyloric defect in the infant are:

(*a*) Congenital abnormality,
(*b*) Hypertrophy, and
(*c*) The theory of pyloro-spasm.

The presence of a congenital hypertrophy of the pylorus is just as plausible, though not as frequent in occurrence, as other abnormalities, such as spina bifida, harelip or torticollis. Cautley and Bent first advanced this theory, which was later elaborated by Neurath, who speaks of a family predisposition, and cites two instances wherein pyloric stenosis occurred three times in the children of one family and four times in another

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*Read before the Mississippi Medical Association, Sept., 1910; published synchronously in *Lancet Clinic.*

family. Examinations of specimens removed from such patients show an abnormal amount of muscular and connective tissue in the wall of the pylorus and a redundance of mucous membrane.

While this theory has many supporters, and is perhaps more plausible than either hypertrophy or spasm, still the fact that symptoms of the malady are rarely present at birth, and in the greater number of cases develop weeks or months after the birth of the child, militates against the theory of congenital abnormality and leaves a certain proportion of these cases without proper explanation.

In support of this theory Deaver has called attention to the fact that the pylorus in almost all these patients, when exposed by operation or autopsy, shows a greatly increased muscularis, not alone in the pyloric sphincter but also in the pyloric end of the stomach; furthermore, the hypertrophic change is sharply defined, and ceases at the pyloro-duodenal junction.

The well-known irritating influence of altered stomach secretions, hyperacidity upon a raw surface, ulcer or fissure, in the production of pyloro-spasm, would rationally account for simple spasm and subsequent hypertrophy of the pylorus but it may be objected that sufficient time has not elapsed in the case of an infant six or seven weeks old to result in the degree of thickening found at operation.

Deaver inclines to the view that pyloric stenosis in the infant is due to hypertrophy following spasm induced by hyperacidity. He also lays stress upon the redundance of the mucous membrane lining the pylorus as a very important factor in the production of this malady.

Perhaps much contained in these concepts of pyloric stenosis is true. The writer of this holds that the tissues of the infant and those of the adult differ principally in age and size; furthermore, those factors, high pylorus, ulcer cicatrices, neoplasms, short gastro-hepatic ligament and gastr optosis, known to produce pyloric stenosis or obstruction in the adult, may also be causative factors in the production of this condition in infants.

However, it is the recognition and management of these cases which most concern us as physicians. Subjectively, vomiting and constipation are prominent symptoms, while the presence of a pyloric tumor and visible gastric peristalsis serve to clinch the diagnosis of pyloric stenosis.

The symptoms of pyloric stenosis in the infant are those of dilatation of the stomach, including epigastric discomfort and swelling, associated with foul tongue, offensive breath, vomiting and constipation.

The partly digested vomitus is suspended in a foul smelling fluid, containing lactic and butyric acid and other decomposition products. A small amount of food may be retained for a time, but full feeding is usually followed by prompt emesis.

The child cries constantly, seemingly from hunger, or the annoyance which food taken into the stomach induces, and early presents the appearance of rapid starvation.

After full feeding the peristaltic movement of the stomach may be seen passing from the cardia toward the pylorus, and in some instances the thickened pylorus may be palpated. The history of these cases recites an apparently normal stomach condition at birth, which is followed in a variable time—days or weeks— by persistent vomiting in the absence of any known dietary causes.

Free vomiting affords prompt but temporary relief, as the thirst and hunger engendered by the withdrawal of food leaves the child irritable, in which condition it remains until food is again administered, at which time the whole process of gaseous distension, pain, eructation and vomiting is repeated time and again, despite medicaments or change in the variety of food.

The vomitus is never bile-stained, and may exceed in quantity that of the last feeding—that is to say the vomitus contains in addition a certain amount of stomach secretions and the decomposed detritus of previous feedings.

Emaciation rapidly ensues, and death from starvation follows in the course of time, which is measured by the amount of food which passes through the pylorus and is assimilated by the intestine.

Bunts collected 114 operative cases of stenosis of the pylorus in infants, of which 84 per cent. showed gastric peristalsis, and 69 per cent. tumor was demonstrable. Cases have recovered of this malady after lavage of the stomach continued over a period of several months. This method, if the child's general condition will permit, should be given a fair trial ere resorting to surgery for relief. One must be very guarded, however, in advising a continuance of this method of treatment in the absence of improvement on the part of the stomach in retaining food and a proportionate increase in the body weight of the child. The dominant note in the treatment of these cases is stomach drainage. Pyloroplasty appeals to one as the most logical surgical procedure for the relief of pyloric stenosis, but this operation was deemed inexpedient in the author's case, owing to the illy-developed duodenum.

In addition to the 114 operative cases of pyloric stenosis referred to on a previous page, we have examined the records of 15 other operative cases, making a total of 129 cases, of which 62 recovered and 67 died.

The following types of operation were performed in this series:

Divulsion of the pylorus, 29 cases with 14 recoveries; mortality 51.7 per cent.

Gastro-enterostomy, 76 cases, with 35 recoveries; mortality 53.9 per cent.

Pyloroplasty, 23 cases with 11 recoveries: mortality 52.1 per cent.

Pylorectomy, one case with no recovery.

From these data one must conclude that success will depend rather upon early surgical intervention than any special type of drainage operation instituted for the relief of pyloric stenosis.

Case.—In May of this year I saw, in consultation with Dr. N. W. Abbott, a three months' infant which was suffering of symptoms of pyloric obstruction.

These symptoms came on soon after birth, and were markedly aggravated after the third week, at which time the mother developed an abscess in the right breast.

The infant had been breast-fed until this time, but some artificial food was now given, upon the assumption that the child was not receiving sufficient nourishment from the well breast which it was permitted to nurse.

Despite lavage, medication and the use of various kinds of artificial foods, vomiting and constipation persisted, and the child continued to lose weight. There was no demonstrable tumor, but the peristaltic waves of the stomach could be plainly seen passing from the cardia towards the pylorus.

A simple enema brought away small particles of inspissated feces and some foul smelling gas. The upper abdomen was greatly distended by gas, but the lower abdomen, legs, arms and chest, were those of a poorly developed child at birth. The sunken fontanelles and the putty-colored and wrinkled skin, together with the deep circles beneath the lusterless eyes, graphically told the story of suffering and starvation.

The child was removed to a hospital, and a posterior no-loop gastro-jejunostomy was performed. In making the anastomosis my assistant held the gut and stomach wall in position with his fingers instead of using the clamps. Twenty-four hours after the operation the child showed no distress after taking nourishment, and has continued free from his old symptoms.

Except constipation, all of the symptoms have disappeared, and, though still under size, the child is thriving and playful, five months after operation.

On opening the abdomen, the stomach was found greatly distended by gas, filling the greater part of the abdominal cavity and lying transversely.

The pylorus was three-eights of an inch in diameter, and imparted the sensation of a solid cord to the examining finger.

The duodenal walls were much thickened, and the diameter of this viscus was, until we reached the duct-bearing portion, less than that of the pylorus. From this point to its junction with the jejunum it had the appearance of a small but normally constructed bowel. The intestines were poorly developed and for the greater part contained in the lower abdomen and pelvis.

NEPHRITIS IN CHILDREN.

BY

WILLIAM F. WAUGH, A. M., M. D.

Dean and Head of the Department of Therapeutics, Medical Department of Layola University, Chicago, Ill.

The problem presented by nephritis as it occurs in children differs in so many respects from that we encounter in adults, that it deserves special consideration. I have before me a suggestive paper by Hutinel* which treats of this question.

Acute nephritis is nearly always due to scarlatina, and here at least rarely eventuates in the chronic form. It is not fatal as a rule, but responds favorably to simple treatment by mild, non-irritant diuretics. Sometimes it does not immediately follow the scarlatina, but develops years later, and then we

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**Le Monde Medicale*, August, 1910.

see the chronic varieties. The predisposition established, a chill may indicate the beginning of the attack, or, as Hutinel thinks, be its exciting cause.

But scarlatina is not the only infection capable of inducing nephritis; which in children is generally of infective origin, at least far more frequently than is the case with adults, Mumps, diphtheria, influenza and erysipelas are cited as causative by Hutinel, who also attributes many infantile nephrites to the numerous infective attacks of the nasal, pharyngeal and allied mucous membranes that occur in childhood, from the access of wandering swarms of micro-organisms, especially the streptococci. The prompt and effiective treatment of such "colds" or "sore throats," is a duty whose importance is only now becoming comprehended.

Many cutaneous affections are followed by renal disease, especially impetigo.

The affections of the stomach and bowels most apt to induce nephritis are those that are of prolonged operation, disordering the liver and followed by purpura. Appendicitis may be included with this group. Suppurative pleurisy, bronchiectasis and especially pulmonary tuberculosis supply a notable number of cases. In all these the delicate structures of the kidney, cells and vessels, are injured by the micro-organisms or their toxins. There is probably a congenital or acquired susceptibility of such malefic impression, as many children similarly affected escape this consequence

The onset is quite frequently heralded by convulsions, quickly followed by general dropsy and dyspnea, all without apparent cause, until the urine is examined. Some cases begin like adults, with digestive troubles, nausea, vomiting, impaired sight and edema; and scanty albuminous urine smelling like beef tea. Blood may be detected in it. Finally, there may be a gradual and causeless decline in health, anemia, headache, and slight fever with rapid pulse, the face or scrotum puffy. The dropsy may be but slight, about the eyes, over the pubes or in the serous or synovial sacs. Sometimes it is not at all evident superficially. Urea, water and chlorides are retained in the tissues by reason of the impermeability of the glomeruli. Some of these cases are wrongly attributed to disease of the heart, the vascular tension being high usually from the renal obstruction, vascular spasm, chloride retention, the excessive action of the adrenals. From this develops consequently the cardiac enlargement, and this passes through the usual stages to venous stasis and gastro-intestinal congestion, and further intoxication. The liver enlarges earlier than with adults.

In the acuter forms the urine suddenly becomes cloudy, scanty and poor in solids, but rich in albumin. If not soon relieved uremia supervenes. In less acute cases these conditions are less marked, hematuria is rare, but the prognosis is worse, as they are less amenable to treatment and are apt to recurrence. The methylene blue test is of the utmost prognostic value. As a rule the chances for recovery are better than with adults. Coma usually precedes death.

The pathology is thus given by Hutinel: The glomeruli are doubled in size, the vessels distended, endothelial and interstitial cells proliferate, diapedesis occurs and the luecocytes infiltrate the connective interstices. The kidney itself is edematous, the tubules blocked by detritus of cells. Cases of unknown origin present a less favorable aspect than those due to scarlatina, especially if the former supervene insidiously, resist treatment and relapse repeatedly. Anuria is grave, and if prolonged more than four days betokens imminent danger. Oliguria is much less formidable, if edema appears, the heart keeping up and the liver not enlarged. Hematuria is of no special significance. The general condition and increasing weight mean much more. Loss of weight shows improvement as elimination is sufficient for the needs. Stationary weight shows it to be unable to remove the accumulated toxins.

Intermittent attacks occur during the prolonged case and then tend to chronicity unless carefully managed. There may be protracted periods of latency, but the child is anemic and development impaired, the urine contains albumin and casts, and the *bruit de diable* is present.

But the reparative forces are active in childhood and lesions from which the adult could not recover are amended in the growing period of life.

Coming to the main question of treatment, Hutinel gives the first place to regime. He begins with water diet, to flush the blood. To a child of six years he gives one pint of fluid, the water of Aix, Evian or Vittel, sometimes sweetened with milk sugar, which is itself an excellent diuretic. Only after two or three days does he allow milk. This food leaves little residue for elimination, it nourishes without fermenting, is poor in chlorides and lowers vascular tension, thus fulfilling every indication. He follows the Weir Mitchell method, giving a child four ounces every six hours, pure or watered, and gives pure water between times. He objects to saline enemas as adding to the objectionable chlorides. As a rule this regime suffices to stop the albuminuria. If not, and a better food supply is imperative, he does not increase the milk as it will cause digestive troubles, but adds a moderate quantity of carbohydrates-vermicelli, vegetable soups, and the sweets and farinacea-corn starch, rice, sage, tapioca, arrowroot and the like.

If the urine still remains scanty and bloody, edema persists and vascular tension is too high, he excludes the chlorides completely, forbids eggs and meat, but allows butter, jam, etc. If no trouble follows a little pork or lean ham may be tried, then white and lastly red meats, which have been unjustly ostracized. Under no circumstances should preserved or canned meats, high game or salt be permitted.

Physical and mental rest must be absolute in grave attacks. Relapses are often due to chilling. The skin should be kept in condition by rubbing and baths. Reinfection is to be prevented by prompt treatment of all local inflammations, mucous or cutaneous (which are really infectious). In acute attacks cupping is serviceable to relieve renal hyperemia, but not blisters or sinapisms. The body in nervous patients may be well wrapped in wet gauze, and covered with oiled silk; but this may induce a vesicular eruption that may later become an avenue for infection. When the acute onset has subsided, derivation is to be sought by steaming, hot air baths, diaphoretics and purge to relieve the kidneys of a portion of their labor.

Despite our efforts the kidney may remain impermeable, and uremic symptoms begin to appear. Then the diuretics of the caffeine group are indicated. Theobromine is excellent but must not be given in large doses. Theocin is usually effective and well borne. Caffeine valerianate gr. one sixty-seventh every quarter or half hour, often answers admirably. If the patient finds the valerian objectionable the pure alkaloid caffeine may be substituted. These small and frequent doses exert an activity for good that can never be appreciated by the practitioner who is only accustomed to give "all of a drug the patient can bear without poisoning."

When the vascular tension is high and the urine scanty, digitonin acts promptly and effectively, when given in doses of gr. one-sixty-seventh every half hour or hour until the pulse relaxes. This is the first of the glucosides of digitalis to act, and frequently the relief following the use of the infusion is due to the speedy relaxation of vascular tension, though mistakenly attributed to the cardiac tensor elements. Like veratrine and its group, digitonin is a particularly safe remedy because it provides for its own elimination. The indications for its application are so frequently met in the acute forms of nephritis as to place digitonin at the head of the list of remedies for this malady. Its effects are evanescent, so that the doses should be rapidly repeated.

It is much less often that vascular tension is so low in these cases as to call for the cardiotonic principles of the foxglove but when this is the case only the germanic digitalin, or digitalein, is permissible. This gives the purest heart-tonic effect with the least vascular tensor stimulation. First to last, elimination is the keynote of treatment in nephritis. Sparteine is the only other heart-tonic permissible, and may be employed as an alternant with digitalein. Cactin is of value whenever the cardiac rhythm is disordered. Of digitalein the dose for a child six years old is gr. one-one-hundred-thirty-fourth to one-sixty-seventh repeated every hour till effect; of sparteine sulphate double these doses may be given; of cactin the same as of digitalein.

When uremic symptoms arise, the digitonin may be aided by small enemas of saturated saline solution—half a pint. I have employed these for years, finding them surely and strongly effective in inducing exosmosis into the bowel and from the blood, emptying the large bowel and draining off a large quantity of toxins. Sometimes they have caused considerable griping, but never any further trouble. But recently I noted a report of fatal inflammation being set up by such an enema, administered by mistake to a patient after an abdominal operation. It would be safer though slower to employ pure glycerin, whose hygroscopic property would subserve the same purpose. A mixture of glycerin and water would be useless except as to washing out the bowel, since the affinity of glycerin for water would be satisfied before it reached the bowel. Enemas of saline solution would be injurous unless more concentrated than the blood, because they would be absorbed and add to the stock of retained chlorides.

When saline diuretics are indicated there is nothing in the older materia medica better than this formula—chloroform and benzoic acid, one dram each; sodium acetate one ounce; water to make twelve ounces. Dose a tablespoonful every two to four hours for an adult; a desertspoonful for a child six years old. As a general diuretic this has been replaced by the more powerful calcium carbonate combination known as calcalith; but whether the latter would be as efficient in nephritis is yet to be determined. Many assert that it is better, but I have had no opportunity to determine this positively.

Most of the relapses after apparent cure may be ascribed to the difficulty of controlling these little patients. Hence the benefit of residence in a warm, equable, well-sheltered locality, where exposure such as may be expected with children may not be productive of ill. Complete control of the diet is almost impossible with them. Much difficulty may be obviated by taking pains to render the food acceptable. Children tiring of plain milk may take buttermilk, junket, whey or clabber; even ice cream made with milk may be utilized. The farinacea offer room for a daily variation of form and flavor. The fruit juices are useful and permissible in every form of nephritis, to a reasonable extent—four to eight ounces daily. The pickled meats are better than any other when some animal food is allowed, and few children fail to take ravenously soured pig's feet, pickled tripe or lamb's tongues; or the various jellied meats.

Whenever the loss of albumin is excessive, enough to seriously drain the patient's vitality, arbutin should be administered to check the loss; beginning with a grain daily and increasing even to a scruple a day or until the loss is checked. The principle indication for arbutin is in the declining stages and during convalescence, to promote curative processes and allay irritation along the entire urinary tract. This glucoside may be continued for six or more months if needed, with benefit.

I do not approve the suggestion of cantharidin, made by Lancereaux, or see how this remedy can fail to do harm in any form or condition of renal disease. The same holds good as to the volatile oils, all which, as well as the foods that contain them, such as cresses, should be rigorously excluded from the use of anybody who has ever been nephritic.

THE CONSTIPATION OF INFANTS AND CHILDREN.*

BY

FRANK BETHEL CROSS, M. D.

Asst. Attending Physician, Methodist Episcopal Hospital, Brooklyn, New York

In the treatment of the constipation of infants and children, much depends upon the *etiology* and so in each case we seek first for that important data which has a bearing upon the causation of the condition. For instance, the history and examination of a constipated infant may reveal a constipation dating from birth and due to an obstructive septum or other developmental defect. Two other birth conditions always suggest themselves: the abnormal development of the folds of rectal mucous membrane to such an extent as to act as obstruent tissues, in which case the name of Martin's valves is applied; and in early life the elongation of the sigmoid. Both of these anatomic faults have a relation to certain cases of persistent constipation, but the other structural defects, such as imperforate anus and atresia, belong properly in the category of surgical conditions of the lower bowel.

The constipation may be acute and due to some variety of acute intestinal obstruction, as volvulus, foreign body or intussusception. Or, in rare instances, chronic obstruction may arise from the pressure of tumors or the inflammatory masses of tuberculous peritonitis. At times anal fissure or anal spasm due to the excoriation of the sensitive mucous membrane may result in constipation, but usually the anal fissure or spasm is secondary rather than primary. Hemorrhoids and anal prolapse are likewise the result rather than the cause of constipation. Most of the above enumerated forms are symptomatic of surgical disease and so fall without the scope of this paper. Of further medical interest is the constipation accompanying paresis of the bowel, this being secondary to some acute febrile disease like pneumonia, typhoid fever and meningitis.

The normal nursling has one or two, sometimes three, evacuations of the bowel in the twenty-four hours. The movements are soft, of pasty consistence, yellow in color and in amount weigh from two to six drachms. The act of evacuation should be attended with but little effort. When the baby has a movement every second or third day or has one daily movement which is formed, hard and dry, the passage of which is accompanied by much straining, then it may be said that the infant is suffering with constipation. It is not wise to let a baby go beyond twenty-four hours without a movement of the bowels.

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*Read Sept. 28, 1910 before Pediatric Section of the Medical Society of the County of Kings.

In the breast fed infant constipation has these etiologic factors. Ofttimes the mother is constipated, in which case I believe that this alone is sufficient to explain the costiveness in the infant. Or, the mother's bowels being regular, the cause of the baby's constipation lies in either a low fat or low sugar percentage in the breast milk, an insufficient amount of food, or an inability to properly digest and care for normal breast milk. The treatment, in consequence, includes the correction of any existing constipation in the mother, and a supervision of her diet which wil result in the consumption of more laxatives or foods which will lead to an improvement in the quality of the breast milk. In either case, liquids are generally indicated, though tea and milk should be restricted because of their constipating tendency. The various malt preparations have sometimes a surprising influence upon the character of the breast milk, increasing its flow and raising its percentage of fat. The ale, stout or porter should be taken with meals. Kerley stands sponsor for the statement that the fat in the breast milk can be increased one or two per cent. by this addition to the diet. Meat and eggs are valuable food stuffs when the maternal milk is of poor quality. The hygiene should not be overlooked: fresh air, daily walks and the establishment of perfect regularity of the mother's bowels are important. Of laxatives to be taken by the mother, preference is given to cascara sagrada or phenolphthalein. To the baby water should be given between nursings, in those over one month old, and if necessary, this can be oatmeal water. When the breast milk very unmistakably disagrees, water should be given before each nursing. Orange juice in the morning is a distinct intestinal tonic, but cannot be used in the very young, say under four months. To make amends for a low fat content in the breast milk good fresh dairy butter, one small piece one-quarter inch in size, can be given daily with much benefit, or cream in one-half drachm amounts two or three times a day before nursings. Well diluted milk of magnesia in small doses is a very satisfactory laxative.

The bottle fed infant under one year may be constipated because of a low percentage of fat or sugar in the milk modification or a percentage of casein in excess, the heating of the milk mixture, or an inability to properly digest what I may call a normal milk mixture (one estimated according to age) or a rachitic tendency with loss of tone of the general muscular system and the muscularis mucosae of the bowel in particular. It is essential, therefore in the case of constipation in the bottle fed, to make careful inquiry into the composition of the food, its manner of preparation, the method of administration, the appearance and composition of the constipated stool, the habits of the baby and its general appearance. From these last may be deduced not alone their bearing upon the causation of the constipation but also the influence the constipation has exerted upon the life and health of the child.

Concerning the *composition of the food*, it may be stated as a general working rule, to which there are exceptions however, that the fats are deficient. This is to be corrected by using a milk richer in fat, as a Jersey or Guernsey milk, by using more top milk or substituting cream for part of the milk used in the food formula or by using butter, as suggested. We must not be forgetful of the caution that fats are not to be used in excess, for a fat excess means intestinal indigestion and in certain cases the establishment of a fat diarrhea. Occasionally a fat excess is responsible for the constipation; in this case the evacuations are hard, very light in color and of very foul odor. Four per cent. of fat should be the limit and I agree fully with those who, like Holt, are not in favor of using a higher per cent. even though the constipation proves obstinate. A low percentage of sugar may be corrected by increasing the lactose to six or seven per cent. or by adding Mellin's Food to the formula, or malted milk may be given twice daily instead of the regular food. A casein excess is to be corrected by reduction to one per cent. This quantity should be well borne by the infant, for it is essential to his healthy growth and development; less than this amount means, in brief, that we court malnutrition and possibly rachitis. If one per cent. is badly accepted, a change to split proteids may be made or the casein may be rendered more readily digestible by the addition of a cereal gruel to the food, which is advantageous after the infant is five or six months old. Before this time, and some times later, an over abundance of starch, digested or undigested, may produce constipation or, what is worse, a persistent flatulent indigestion, which has for its end results anemia and malnutrition. Oatmeal water is the cereal of choice when the bowels are costive.

In the *preparation of the food*, the heating of the milk modification for the purpose of either pasteurization or complete sterilization frequently renders the mixture more or less constipating by making the casein less digestible. This fault, when present, is corrected by using the food unboiled. The gain of using a sterile food is often more than offset by the constipation resulting. In order that the bacteria present in the milk shall be the fewest possible and the food, therefore, most wholesome, preference in artificial feeding is to be given the certified milk bearing, in Brooklyn Borough, the certification seal of the Milk Commission of the Medical Society of the County of Kings.

Administration of food has special reference to the amount given and the frequency of the bottles, and the relation of the feeding to the giving of water and the use of fruit juices. I am aware that all pediatrists are not agreed that the use of water is necessary in the first two months of babyhood, but, personally, I look upon it as a required adjuvant in the dietary treatment of constipation in the bottle fed, and the older the baby, the greater the need. The water is best given between feedings. Orange juice or the juice of stewed prunes in one and two teaspoonful doses twice daily between bottles is a definite aid.

The *habit of daily evacuation of the bowels* may be inculcated in the very young. If the mother, or nurse, after the morning bath, will place the baby on a small commode held between the attendant's knees or holds the baby so that the buttocks extend out over the commode, it will require but a few weeks' persistence before the endeavor is successful and the bowels move satisfactorily at every sitting. This is a simple procedure, but it requires considerable patience on the part of the mother and is frequently neglected. In cases of even persistent constipation this maneuver will prove of particular benefit and is one of the most important factors in the successful treatment of this condition.

Laxatives are necessary in the treatment of infantile constipation; always in the early treatment and occasionally in the later course of the treatment. We must remember that the object of our treatment is to prevent constipation and that our medicines must be given in such quantity that the bowels will move daily, which is the goal for which we strive. If we wait until constipation is present and then, after one or two days' constipation, give a laxative, we are departing from the rational plan of the treatment. It should be our aim to produce a daily evacuation of the bowels, and to this end small regular doses of laxatives will tend when used in the early days of the treatment.

For the smallest infants, manna and magnesia (milk of magnesia) added to the evening bottle are two of the preparations used most advantageously, but as the children grow older it is generally sufficient to rely entirely on the oily laxatives. My personal preference is for olive oil. This should be given in the morning, the dose varying from one-half to two drachms. Occasionally better results follow the evening administration of oil. The rationale of this substance is evident after what has been said of the use of fats in constipation. When the general nutrition is poor, cod liver oil, which is well accepted by infants and children, serves the double purpose of food and laxative. A constipation diarrhea developing, the drug of choice should be castor oil. In chronic constipation, however, it has no field of usefulness at all; the period of obstipation which ensues upon the free movement of the bowels is the very phenomenon which we wish to avoid and which defeats our efforts in treatment. In the nursling and bottle fed infant, cascara, aloes and podophyllin have no indications.

In children beyond the age of one year we occasionally must rely upon drugs other than the oily laxative mentioned. Calomel or mercury with chalk has a special usefulness when the stools are pale and there is much flatulence; the ordinary restrictions are recognized, however, and neither of these preparations is to be used with great freedom. A drug of great value is phenolphthalein. This substance, originally used only as an indicator in analytical laboratory work and accidentally found to possess laxative properties, is now marketed in various chocolat and flavored preparations, which are greedily accepted by children. It is non-toxic and produces a smooth, soft evacuation without cramps or griping. Such a drug has a very definite usefulness in the field of pediatric therapy. The usual dose is from one-quarter to one grain, depending upon the age of the patient.

Massage of the abdomen is of doubtful value as performed by nurses and mothers, but when the patient can be treated by a skilled masseur we should expect some benefit. The finger of the masseur should not rub over the skin, but should be pressed with firmness so that in the to-and-fro or rotatory motions the skin will move with the fingers over the underlying deeper parts. General abdominal massage is of use when there is a poor musculature; of particular value, however, is the massage of the central portion of the abdomen and the massage over the descending colon. In the mid abdominal region the technique is rotatory; in the region of the descending colon an up-and-downward stroking, the downward stroke for obvious reasons being the heavier.

Faradism, to my mind, has a doubtful application in the treatment of constipation in the young.

The question of *rectal medication* in constipation requires special consideration, for one hears much among the laity of the reputed value of enemata and soap suppositories. Both methods have a distinct field of applicability. I think we should remember that this entire plan of the treatment is adjuvant and not to be followed as the one method of treating these cases. When an infant, despite the correction of dietetic errors and the administration of mild laxatives, continues to be constipated, it is well to rely first on the soap suppository, a stick or pencil formed by whittling a piece of common soap into a cylinder, one-quarter inch in diameter and from one to two and one-half inches in length. This is either inserted in its entirety into the bowel or held in the rectum by the nurse; at the end of five, ten or fifteen minutes the pencil will be expelled and as a rule defecation immediately follow.

When the infant has been neglected and a fecal mass lies impacted in the rectum, the soap suppository will prove insufficient, and in this extremity one must use the classic soapsud enema and possibly digital removal of the dry inspisated feces. The addition of glycerin and magnesium sulfat increases the efficiency of the enema, but is more useful when there is much intestinal flatulence. When constipation is due to an elongated sigmoid, the only rational treatment is high rectal enemata.

Olive oil has a special use when injected per rectum, appearing to soften the fecal mass and act mechanically as a lubricant. In the more obstinate cases of constipation, it is used not in considerable quantity as an immediate enema, but in small amounts introduced nightly into the bowel to be retained. As ordinarily done, from one-quarter to one ounce of oil is injected high by means of a velvet eye catheter and small infant's syringe; if the child is at once put to sleep, the oil will be retained until the morning. Its effect upon the bowel appears to be that of a local tonic; its lubricant properties, of course, are important.

Glycerin suppositories and solutions act by dehydration of the rectal mucosa with a resulting hyperemia of the membrane and a reflex increases of peristalsis, and are more active than soap pencils and enemata. Recourse to them should be had only when urgent causes present themselves, however, for the bowel irritation is quite marked and in infantile constipation it must be remembered that we strive for the maximum results with the minimum medication. Gluten suppositories are much less irritating, hence slower in action; they are best inserted at bed time in the expectation of producing a bowel evacuation the following morning. With the medicated suppositories I have had no experience.

Beyond the first and until the third year, no sharp line of demarcation in plans of treatment can be drawn. Various etiologic factors appear and merit special consideration, as the excess of starchy foods, but on the whole the same principles of treatment obtain.

From two years on the diet of the normal child is considerably more extensive than the diet before that age. It includes milk, soups, meats, vegetables, breadstuffs, pastry, puddings, fruits and sweets. Mothers always ask us what the child may eat and in answering this question, let us bear in mind these points; the food must provide sufficient nourishment to meet the demands of healthy growth, it must provide a sufficient residue in the intestinal canal, it must, to a degree, stimulate peristalsis and it must contain sufficient fluid so that the onward progress of the intestinal contents will be facilitated. Furthermore, it must not be such a coarse indigestible diet as to lead on to indigestion, malnutrition, anemia, marasmus and rachitis. As aptly stated by George Still, "The dietetic treatment takes us in fact between the Scylla of constipation on the one hand and the Charybdis of indigestion on the other."

A selected diet for the older child suffering with constipation would properly allow the following: *Soups*: animal broths, purees of peas, beans, spinach; *meats*: beef juice, rare beefsteak, rare roast beef, lamb chop, roast chicken; eggs: steamed or soft boiled. *Cereals*: thoroughly cooked oatmeal, cornmeal, wheaten grits served with butter and sugar; *breads*: whole wheat bread, graham crackers, oatmeal wafers, ordinary white bread with a percentage of bran added; gingerbread and brown bread are laxative, but because of the excess of sugar are difficult of digestion and produce much gastric flatulence. Butter should be used freely. *Vegetables*: green peas, string beans, spinach, creamed celery, stewed onions, lettuce, strained stewed tomatoes; *fluids*: whole milk should be restricted to one or two glasses per day and malted milk used instead; no tea or coffee. Digestible cocoa is allowable. Water should be given freely at the end of each meal and at bed time. *Desserts*: junket, cornstarch, cup custard, plain ice cream, stewed fruits, stewed berries, orange juice, fresh grape juice, ripe apples and pears. The fruits and berries are especially valuable because of their vegetable acid content and the mechanical irritation of the cellulose and the seed elements. Honey and molasses are laxative, but in excess are productive of indigestion.

After four years of age, the child may eat figs, dates, fish, potatoes, peaches and plain puddings.

In the older child habit is deserving of particular mention. I am of those who believe it possible to form the habit of regular evacuation of the bowels daily at a certain fixed time, and that it is possible also to start a constipation chronic throughout life by the persistent disregard of the inclination to defecate. We all have seen the school boy too busy with his play to leave it long enough to have a bowel movement when the desire was present, we all know the pale, anemic, tea-drinking school-girl who neglects "nature's call," and we all have heard of the unwitting school teacher who in her crass ignorance disregards an important rule of health and refuses the children permission to leave the class room except at the usual recess hour. Between them how many the cases of chronic constipation produced! The child must be taught that the bowels should move daily and regularly at a certain hour, and that this regularity is essential to his good health, present and future. At the stated time, he should strive to effect an evacuation and to that end a low commode, which will necessitate a squatting position similar to the natural postural attitude, will contribute.

The problem of *medication* is more simple in the child than in the infant. In each case the therapeutic agents must be chosen with care and with especial reference to the individual. Of the simple laxatives, phenolphthalein, phosphate of soda, rhubarb, cascara, senna and sulphur are favorites and each has its special indication. When the constipation is of long standing, calomel in small divided doses is of benefit in the early days of the treatment. I particularly deplore the "Saturday night purge" as used in many families.

In the older children, enemata play a less important part, though the plan of nightly olive oil injection into the lower bowel is often particularly effectual when the case is obstinate.

The efficacy of *general tonic treatment*, out door life and exercise is not to be overlooked or underestimated. Patience and persistence in treatment have their reward.

141 *Seventh Avenue, Brooklyn.*

A CASE OF HYSTERIA IN A BOY.

From the Department for Neurology of the Boston City Hospital.

BY
ARTHUR WILLARD FAIRBANKS, M. D.
Boston.

The following case is reported because it is an absolutely typical case of hysteria in a child, but is not a typical example of hysteria in childhood, that is to say, it is so perfect a case of hysteria that it thereby forms an exception to the disease as ordinarily seen in children, and it therefore becomes by its very completeness worthy of record. Then also, although such cases are not unknown to specialists there is, I have found, a wide spread skepticism among medical men, even among such as are devoting themselves to the special study of disease in children, as to the occurrence of typical hysteria in boys. Moreover, the case presents some features of interest to specialists who have particularly studied the neurotic disorders of childhood, and I especially submit the case to the attention of my esteemed colleague D'Orsay Hecht of Chicago, who in an admirable paper on Hysteria in Children published in 1907, says that "hemi-anaesthesias are practically unknown, or have been reported only in children of more advanced years;" presumably meaning those well beyond puberty. It also proves another point not, I think, sufficiently realized that the palsies of hysteria are not "characterized" by flaccidity, and *may resemble* in distribution the palsies of organic disease. I have in mind in this connection other cases seen at our clinic at the Children's Hospital in which spastic pseudo-paralysis was the most striking feature of the symptom-complex. I have said that this case in its very completeness is worthy of note in connection with hysteria in childhood, and I refer particularly to the appearance of the typical stigmata of the affection. It is in this respect, par excellence, that the hysteria of childhood differs from that of adult life.

The occurrence of typical so-called stigmata is the exception not the rule in childhood. It is undoubtedly due to this fact that instances of true hysteria are so often unrecognized in children. These stigmata, consisting of restriction in the areas of the visual fields, the occurrence of areas of anaesthesia in the skin and mucous membranes, and the existence of zones of hyperaesthesia, especially along the spine, all so common in the adult, are of relative (though not absolute) rarity in children.

It is difficult to explain why the subject of hysteria is so neglected in the text books of pedriatrics, even one devoted to the subject of "Nervous Diseases in Childhood," otherwise a most excellent volume, gives no space whatever to this subject.

Boy 11 years. First seen May 24th, 1907.

Family History: Father died of sudden cerebral affection at the age of 44. Ill five weeks with loss of speech and complete paralysis, occurring, his wife says, in the midst of health. He was her second husband and the father of the patient.

Mother is a patient of ours, suffering with involutional neurasthenia.

Sister: A confirmed hysteric. When 16 years of age she became suddenly completely "paralyzed" and lost the power of speech. Was in bed three months, and then in a sanitarium for 11 weeks where she greatly improved. Ever since then she often loses her speech, and sometimes the use of her hands.

Brother: Very nervous, but has never been paralyzed.

Another brother at the age of two years became parlayzed in the right arm and leg. Probably anterior poliomyelitis.

Previous History: When seven months old had diphtheria which is said to have been followed by paralysis which lasted until he was a year and a half old. Adenoids were removed at five years. Always a nervous and easily irritated child.

Present Illness: In January, 1907, was taken with what a surgeon thought was appendicitis. He recovered without operation. Three months later he was thought to have gall stones and was kept for a week in a hospital under observation. When he returned home his mother noticed increased irritability and frequent complaint of "awful pain" about the heart, and he commenced to have sudden attacks in which he would throw his legs forward and fall on the floor. One day he complained of sudden pain in the right groin and had to be carried home. Attacks occurred, without loss of consciousness, in which his face became scarlet and he "shook all over," and complained of "something going all over him," and his legs had "jerky sensation." He often complains that his "hands and feet ache." Cries a great deal, and is easily frightened, especially at night. This condition, the mother thinks has been coming on a long time.

The school teacher says that he cannot remain quietly in one position for more than a very brief period, then utters a scream or exclamation and drops on to the seat or floor. The screaming seems to relieve him. He is never unconscious. Often awakens from sleep screaming or crying, especially if he hears a noise. Last night he had an attack in bed in which he "jerked all over."

Physical Examination: Well nourished and a fairly well developed boy corresponding to age; with no signs of puberty. Gait and station normal. Marked tremor of eyelids when he attempts to hold them closed. Pupils regular and react normally to both light and distance. Both visual fields concentrically limited, the left more so than the right.

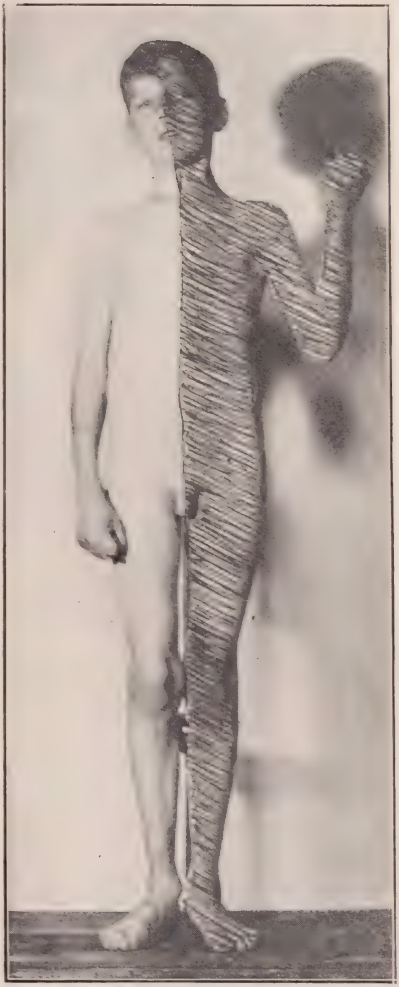
Hemi-hypaesthesia of the entire left half of the body, including accessible mucous membranes. Right knee jerk and right plantar less than the left. All reflexes rather lively. No paralysis and all cranial nerves normal. Tongue tremulous.

During the ensuing summer the boy was sent away from home to a farm, where he was much better. Almost immediately after his return home he had six convulsions within a week.

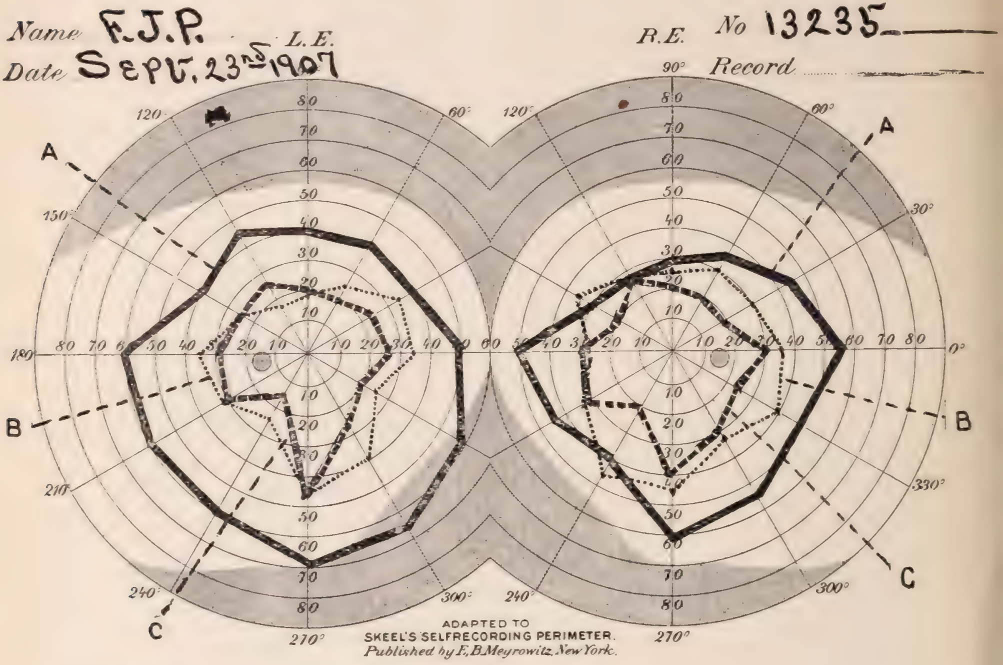
These began with a feeling of precordial weakness, followed by an attack lasting an hour, of violent character, with opisthotonos and retraction of the head.

Examination at this time showed practically the same condition. The anaesthesia and analgesia was made to disappear by suggestion in waking state, by means of fictitious "magnets" (tuning forks) applied to his head. About ten days after the convulsions above described there suddenly appeared a spastic hemiplegia of the left arm and leg, the arm being held in a position of semi-flexion at the elbow and the leg drawn stiffly along. Practically complete left hemianesthesia and hemianalgesia existed. All of the motor disturbance was made to disappear by application of the fictitious magnets accompained by strong suggestion, and the boy walked out of the clinic as well as ever. Two days later he "had a shock," fell, and, after a moment or two of a "jerky" feeling in the left arm and leg he was left with the hemiplegia. This cleared apparently spontaneously. On his next visit the entire condition was easily produced by waking suggestion.

When the "magnets" are applied and suggestion is made a sense of numbness is induced in the arm, and gradual slow contraction of forearm, wrist and fingers occurs, marked in arm and fingers. At the time when semiflexion is reached he complains of pain in the region of the elbow. The contractions can be but partly overcome, and only with the employment of considerable force. A hemihypalgesia of the entire left half of body, face and extremities is present, more marked in the upper half of the body, but present even on the left half of penis and scrotum, ceasing abruptly at the median line of the body. (Vide pho t graph.) The contraction is made to disappear in a few mome n



by suggestion, but some diminution of sensation remains, and the restriction of the visual fields is entirely uninfluenced. (Vide diagram of fields on the perimeter scale.)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Date Sept. 23rd 1907 Record

ADAPTED TO
SKEEL'S SELFRECORDING PERIMETER.
Published by E. B. Meyrowitz, New York.

A. **White**
B. **Red**
C. **Green**

One month after the above convulsions he had another appearing in the night and lasting twenty minutes. He recovered promptly when he was placed on the floor of an empty room and left there alone. Examination two days later showed no anaesthesia, no paralysis or muscular spasm, and the visual fields were much less restricted than previously. A few days later another convulsion lasting nearly an hour occurred, and when examined a few days later the hemianaesthesia had returned. About this time there developed delirium and somnambulism at night, with extreme restlessness, morbid fear and auditory hallucinations. Complained of "snapping of bullets" about his head. During the day he is restless and irritable, and "pounds his feet" on the floor.

After five days and nights of this state of affairs he suddenly developed mutism, lasting forty-eight hours, and disappearing as suddenly as it came. The objective symptoms remained unchanged. On the left side he could not open the eyelid after I closed it, but could do so on the right. During the next month he continued to have hallucinations of "snapping bullets" and "people trying to kill him" at night. Says he "feels" the bullets.

Toward the end of this month he again developed a right semiflexion of the left arm. Attempt to passively overcome this condition caused cries of pain. Condition removed by suggestion.

The above description affords a sufficiently complete picture of this boy's condition. He has slowly improved on the whole during the past three years. At times for long periods he has been able to attend school. With but a single exception the limitation of the visual field has always been present and marked, and on the only occasion when it was not, it was not tested by the perimeter.

The sensory disturbance has also been very persistent. It can be always lessened and often be made to temporarily disappear by waking suggestion, but I have never personally been able to transfer it completely to the other side by suggestion in the waking state, but I have demonstrated to my class that complete transference by suggestion in hypnotism is easily accomplished.

What the eventual outcome of the case will be, it is not possible to say, but I agree with D'Orsay Hecht that the outlook is much more favorable in the child than in the adult. Nevertheless, I believe the strong neurotic family history in this boy is against him. I consider also those cases in which the so-called "stigmata" are present, and pronounced, to be less favorable than the average case as ordinarily seen in childhood.

I shall have something to say at a later date in regard to what can be done in hysteria as commonly seen in children, and shall cite some personally observed cases as illustrative.

Fortunately but few instances of hysteria in early life are so typically perfect as this one; nor is the disease always planted in such fertile soil, but there is always a background of unstable nervous and psychical equilibrium in the individual.

The affection never develops in the previously normal being.

ON TORTICOLLIS AFTER THE REMOVAL OF ADENOIDS OF THE NASOPHARYNX.

BY

JOSEPH WEINSTEIN, M. D.

New York City.

The removal of a hypertrophic pharyngeal tonsil undoubtedly belongs to those operations that are most frequently performed by general practitioners, as well as by specialists.

The healing of the wound after this operation (intervention) is, in general, normal and uncomplicated, apart from postoperative hemorrhages occurring now and then; at most a day or two after the operation, a slight increase of temperature is noticed.

During the last six months, we observed, in two cases at Dr. Max Scheier's Poliklinik, Berlin, a peculiar complication after adenectomy, viz., that a few days after the operation, a torticollis had occurred. At first, we could find no apparent explanation for this disorder, and were also not quite sure about the prognosis of this affection, since we found no information concerning the question in text books on rhinology. This induced us to examine the complication more closely and to investigate thoroughly the special literature. After observation of our two cases, we were inclined to believe that torticollis after operations of adenoids occurred more frequently than was found in literature, and we therefore decided to publish our observations.

In the first case, we had to deal with a strong, eleven year-old boy from southern Russia, who had been suffering for many years from an obstruction of the nose. The naso pharynx of the child, whose facial expression was characteristic of adenoids, was for the greatest part filled by the hypertrophic pharyngeal tonsil, so much so, that only the lowest part of the septum could be seen. Adenectomy was performed without narcosis by means of Gottstein's knife. The boy was very restless and could be held only with difficulty by two nurses. It was especially hard to keep his head fixed. The adenoid vegetations were removed in toto. Three days after the operation, the relatives of the patient noticed that he was holding his head obliquely, the chin was turned towards the left side and somewhat raised, while the right ear was drawn down to the shoulder.

The next day the torticollis was fully developed, and even the slightest movement of the head was extremely difficult.

The right sterno cleido mastoid muscle was strongly prominent and extremely tender to the touch, especially marked in its upper part. There existed loss of appetite, anorexia, for several days, together with slight increase of temperature (of 38.2 to 38.3 celsius). The spasm continued also at night. Eleven days after the operation, the tension of the muscle subsided after treatment, consisting simply of a rest in bed and hydropathic applications. On the fifteenth day the child was dismissed as cured.

Case II. was that of a boy, Martin D., seven years of age, who had been operated upon for adenoids when three years of age. The recurrence had come very soon after. The boy spoke so indistinctly as to be scarcely understood. The submaxillary glands were swollen. Adenectomy was performed; the patient was very restless during the operation. The vegetations, covering the whole septum and visible even when simply pressing down the tongue, were completely removed with Bechmann's knife. Three days after the operation, the contraction of the left sterno cleido mastoid muscle appeared. Below the ear and at the posterior margin of the sterno cleido mastoid, small, swollen, tender glands were felt; no rise of temperature appeared.

As in the first mentioned case, the pain at every movement of the head was very severe. It was impossible to move the head into the normal medial position. The left sterno cleido mastoid muscle was felt bulging beneath the skin as a tender string.

Investigating the foreign literature of the subject, we found but few analogous cases. Mackernow reports a similar observation, while two cases have been reported by Ferreri, and one by Knight.

In the German literature, we find only one article by Neufeld that appeared recently in the Archive of Laryngology. Neufeld observed this condition three times during the last five years. In all the three cases, a rise of temperature up to 38.5 celsius had occurred.

Thost several times observed a peculiar position of the head, after the removal of a pharyngeal tonsil. The vertical vertebral column was entirely stretched and held somewhat to the front, and the lateral movement of the head was associated with pain.

Concerning the cause of torticollis, we might assume in both our cases, in which the children were very restless during the operation, and the head could be kept fixed only with great difficulty, that we were dealing with a lesion of the sterno cleido mastoid, or with a distortion of the muscle, due to injury of some of the fibres of this muscle. As we know, cases of wry neck are observed in the new-born after confinement, especially after a breech presentation. In these cases, immediately after confinement, we feel the sterno cleido mastoid swollen either in its entire course or at a circumscribed place, and after about fourteen days the swelling becomes hard and a shortening ensues. We have then to deal with a trauma, i. e., with a rupture of the muscle.

Thost considers inflammatory alterations of the lymph-glands on the mus. vertus capitis a cause of this torticollis, this inflammation being caused by an infection of the operative wound. Ferreri thinks the infected lymphatic system of the musculature of the neck brings about the torticollis. According to Neufeld, the occurrence of more deeply located and tender lymph-glands, were the cause of torticollis. Knight regards an injury of the fibres of the sympatheticus in the nasopharynx, from its reflex irritation, to be the true cause.

The observation by Gillette is very interesting. He found that in two cases a torticollis was cured by operation on the hypertrophic pharyngeal tonsil.

I should like to mention further, that ear reflex-phenomena at the sterno cleido mastoidens have been observed Schwartz, (*Handbuch der Ohrenheilkunde*, 1892, p. 453), for instance, induced in a patient a tonic spasm of the M. S. C. on the affected side by cauterizing a granulation on the wall of the tympanum. In another patient, with an acute exudative (inflammation) of the tympanum, a tonic spasm of this muscle subsided after performing a paracentisis.

The prognosis of torticollis occurring after adenectomy is favorable. In all cases a complete recovery occurred without any special measures.

261 Central Park West.

SOCIETY TRANSACTIONS

Mississippi Valley Medical Association.

Discussion: Dr. Haines' paper. Dr. Hugh T. Patrick, of Chicago, said he had had in the past month five cases of pyloric stenosis, these cases having occurred early in the life of the infants, in the first three weeks. The essayist stated that the greater number occurred later in life. but his experience had been that they occurred earlier. The cases he had seen had been operated on early following a prompt diagnosis. In one case, the sixth, the operation was done late. There was a delay of three or four days, hoping that the stenosis might be overcome. This child died following the operation. There is no temporizing in these cases. Operation should be done early and by one skilled in surgery.

Dr. Nathan Rosewater of Cleveland, Ohio, stated that a mother brought her little child to him with a history of vomiting. The child was about three months old. It had vomited since birth. He introduced a catheter and found a great deal of foul smelling material and hard masses. The child was very much emaciated, and he prescribed some liquid albolene, thinking if there was any opportunity at all for the pylorus to yield, something might pass through, soften the feces and give a chance for the spasmodic contractions to start. The child improved; vomiting had ceased and the whole thing stopped, and the child got along very well. What he likes about using liquid petrolatum there is no obstruction, as it passes through the rectum and out, softens all food masses and the feces so nicely that he had prescribed it for many cases with gratifying results.

Dr. Fenton B. Turck, Chicago, said that in cases with marked stenosis there was rapid emaciation, particularly when there was dilatation with an obstruction of a mechanical character. If this mechanical obstruction continued the only method of treatment was an operation. Waiting until the toxins had destroyed the power of resuscitation was followed by a very high mortality. Prompt attention should be given to overcoming infections that occur early in infancy in the gastro-intestinal tract, and with this careful attention not only to the stomach but to the entire alimentary tract, improvement would be obtained early, and if there was continuous stenosis early operation should be instituted.

Dr. W. D. Haines, in closing the discussion, desired to impress upon the members the early recognition of a very serious trouble that did not demand immediate surgical intervention, yet a trouble that demanded the advice of a surgeon in consultation with the internist who had charge of the case, because he thought one would look at the facts, pyloroplasty in the adult had been reduced to less than one per cent. mortality. In the child the mortality was more than fifty per cent., and yet the operation could be done early with a greatly decreased mortality.

To Reduce Infant Mortality in New York.

Plans for the summer campaign are being formulated by the Conference on the Care of Babies, and the Committee on Organization and Co-operation is endeavoring to secure more perfect co-operation among the various organizations belonging to the conference and thus to avoid the duplication of work. To facilitate this work, Dr. S. Josephine Baker, chief of the division of child hygiene of the Department of Health, acting for the committee, has sent a series of questions to the various agencies, which will enable the committee to ascertain just what work is being done by each and thus a duplication of work be avoided.

RETROSEECT OF CURRENT PEDIATRIC LITERATURE.

Diseases of the Nervous System in Children.

Under the Charge of

ARTHUR WILLARD FAIRBANKS, A. M., M. D.

Instructor in Clinical Medicine, Tufts Medical College; Attending Neurologist Children's Hospital, Boston.

Spastic Paralysis: Relief of spasm by resection of the posterior sensory roots was first performed by direction of Foerster of Breslav, the first account of which appeared in 1908. The first thought that naturally occurs to everyone, when such an operation is suggested, is of the sensory damage that seems at first sight inevitable. Sherrington, however, by means of experiments on monkeys demonstrated the very interesting fact that resection of one, or even two of the sensory roots, does not cause anaesthesia, and that the sensation of any given area of the body is served through three roots, and that no anaesthesia occurs unless three *adjoining* roots are severed. *This* is the rule therefore, in operating, not to divide more than two adjacent roots.

As to the number of roots to be cut in any given case, Foerster believes that in severe spastic paraplegia at least four on each side should be resected. In very light cases possibly three might suffice. In the arm he thinks also four at least should be selected. C5 C6 C8 D1, for instance, or C4 C5 C7 C8.

In a case of my own, a twelve year old girl, with slight spasm in the adductors of the thigh, and well marked spasm in the flexors of the legs and feet, (hamstring and calf muscles), I had the second and the fifth lumbar, and the first sacral, on both sides, divided. This case is too recent to yet determine the ultimate result. I give further on a table of the functional cord levels for the lower extremities, as given by Foerster, from a study of the work of Kocher, Bruns, Lazarus, Wickmann and Oppenheim.

The roots are exposed by bilateral or unilateral laminectomy. Tietze, who did the first operation for Foerster, prefers the bilateral operation, while Alfred S. Taylor of New York advocates unilateral laminectomy. To anyone who has witnessed many operations on the cord, for other conditions, certainly the small space in which the work has to be done seems none too much, and the double laminectomy appeals strongly as the preferable procedure.

Care should be taken to check the oozing of blood by sponging, and occasionally filling the wound with gauze or cotton for a few moments, before opening the dura. If this is done carefully and without haste, there is very little hemorrhage, not enough to obscure the field of operation when the dura is incised. As soon as the dura is opened there is of course a welling up of cerebro-spinal fluid into the wound, but this soon diminishes, and thereafter is easily controlled by sponging, as is also the oozing of blood from the cut dura. The roots are then divided. Considerable difficulty may be at first experienced in determining which are the sensory and which are the motor roots, in the canda equina, below the first lumbar vertebra, for the two roots pass out close together; but the sensory root is larger and lies outside of the motor root, that is farther away from the middle line of the body, and no twitching results when it is irritated. The dura is then closed by continuous cat gut suture and the rest of the wound closed in the usual way. After the operation for a few days a flaccidity of the limb with considerable pain ensues, the first due probably to the effect of the shock of the operation on the cord, the latter to irritation in the incised ends of the roots. Both of these conditions soon pass away, and spasticity does not return or, at the worst, remains in greatly diminished degree. Athetosis and associated movements when present also disappear. Some ataxia, though usually slight, may appear. In one or two of the nine instances, of which I have sufficient data, some sensory disturbance resulted, in one considerable, but this is exceptional.

The results are excellent as far as relief of spasticity is concerned, and very encouraging in the improvement in function, especially in locomotion, surprisingly so when we consider the character of many of the cases thus far selected for the operation. It must be considered a defect of judgment for instance to select a feeble minded spastic diplegic for such an operation if the ultimate value of the procedure is to be demonstrated.

Once the handicap of muscular spasm is removed, the future depends upon the systematic carrying out of practised exercises conducted intelligently for months and years. These exercises being necessary to overcome the faulty habits of position and movement engendered by years of action or inaction under the unfavorable muscular and articular relations produced by the muscular spasm, and muscular contractures. Everything depends, in this stage of the treatment, on the intelligent co-operation of the patient. This is not to be found in mentally defective individuals. Such cases are as favorable as any others of course for demonstration of the efficacy of the procedure for the relief of muscular spasm, but not for demonstration of restoration of function.

As the relief of spasticity is now a demonstrated fact, let us hope that in the future those cases will be selected for the operation where by virtue of the intelligent co-operation of the patient the maximum amount of restoration of function will be rendered probable, and also worth while. Another thing that must be kept in mind in selecting cases for this operation is the amount of actual paralysis that is present.

It is often exceedingly difficut to accurately determine in how far the loss of function is dependent on mere muscular spasm, muscular shortening, faulty position and articular or ligamentous changes, and how much is due to actual irremediable destruction in the cortico-pyramidal system. Each case should be carefully studied before the decision is made, and only those selected in which the maximum disturbance in function is due to muscular spasm or abnormal involuntary movements, such as post hemiplegic chorea and athetosis. Cases with contracture due to muscle shortening, or postural deformity need not be excluded, provided such conditions are not due to extreme muscular paralysis, but they must be treated in addition to the Foerster operations by tenotomies,tendon transplantation, arthrodesis, and other suitable orthopedic measures.

Naturally such conditions can in no wise be remedied by resection of the sensory roots alone.

Finally, given several cases of spastic paralysis, otherwise suitable for the operation, those cases will probably show the best eventual results, that are instances of acquired paralysis where not too long a period has elapsed between the onset of the condition and the operation for the relief of the spasm. Better still will doubtless be the ultimate result the more perfect the acquirement of normal function before the onset of the lesion. This is:—Spastic paralysis acquired after the second or third year although it may be equal in degree to given case previous to this age, will show greater restoration of function as time goes on. It must be also kept constantly in mind in the after treatment that in long standing cases, however great may be the relief of the freedom from muscular spasm, faulty habits of locomotion or other movement have developed in the attempt to overcome or to compensate the resistence of the muscular rigidity and these habits and tricks of movement must be eliminated by long patient training.

I give here for the use of those to whom it may not be accessible the table of functional cord levels for the lower extremities as based by Foerster on a study of the work of several investigators.

Flexors of thigh, L1 L2 L3 L4L5 S1.

Heopsoas, L1 L2 L3.
Sartorius, L1 L2 L3.
Gracilis, L2 L3 L4.
Tensor fasciae, L4 L5 S1.
Extensor of thigh, L5 S1 S2.
Glutens maximus.
Adductors of thigh, L2 L3 L4 (L5).
Abductors of thigh, L5 S1 S2.
Glutens medius et mimimus.
Inward rotators of thigh, L3 L4 L5 S1 S2.
Adductor magnus pars inferior, L3 L4.
Tensor fasciae, (L4) L5 S1.
Glutens medius et minimus, L5 S1 S2.
Outward rotators of thigh, L5 S1 S2.
Extensor of leg, L2 L3 L4.
Quadriceps femoris.
Flexors of leg, L5 S1 S2.
Biceps, Quintendinosus, Semimembranosus.
Extensors of foot, L4 L5 S1.
Tibralis Anticuo, Extens. com. long. Extens. h. 1.
Flexors of foot, L5 S1 S2.
Gastrocnenius, Peronens longus, Flexor com. 1.

In considering this method for the relief of muscular spasm we should keep in mind the fact that it is applicable to cases of athetosis, and probably also to those movements, more choreiform than athetoid in character, seen in children in whom examination may either reveal well marked signs of cerebral paralysis, or, as sometimes happens, very slight evidence of the same, other than the abnormal movement, in the shape of heightened reflexes or the presence of abnormal reflexes, as the Babinski or Oppenheim, etc. In such cases the movement is perhaps to be regarded as only an intermittent form of increased muscle tone.

It is to be hoped that this operation will be done more and more in the immediate future, in order that we may have further confirmation of the range of usefulness of the procedure, and that its present promise may be completely fulfilled, as one of the most valuable contributions, in recent years, for the relief of hitherto intractable conditions.

Diseases of the Alimentary System.

Under the Charge of

JAMES WARREN VAN DERSLICE, M. D.

Assistant Professor of Pediatrics, Rush Medical College, Chicago, Ill.

Helminthiasis in Children: (*Am. Jour. Med. Sci.*, May, 1910). Schloss in an exhaustive study of these cases gives a report of finding in 319 children of which 280 were made on consecutive children, 80 harbored intestinal worms.

There were 20 cases of hymenolepis nana or dwarf tape-worm. The average length of this parasite is 0.8 of an inch and contains from 110 to 120 segments. The number of parasites present in a patient ranges from a few to thousands. The blood examinations with a single exception showed the percentage of eosinophile cells increased to five to twenty per cent. In all cases there was a secondary anaemia. He recommends the use of male fern in these cases. He summarizes:

1. Twelve of thirty children who suffered from unexplained nervous or gastro-intestinal symptoms were found to harbor intestinal worms.
2. Consecutive examinations of 280 children showed that 80 harbored intestinal worms and five of these harbored two species.
3. Thirty-one harbored trichuris trichiura, 23 oxyuris vermicularis, 20 hymenolepis nana, 6 ascaris lumbicoides and five tenia saginata.

4. Only one of thirty-three children infected with trichuris trichiura suffered from symptoms.

5. Thirty-five of the 51 infected with other parasites suffered from symptoms.

6. The eosikophile cells were not increased in the trichuris trichiura cases.

7. Intestinal worms may be harbored without inconvenience to the host. On the other hand symptoms may occur which are always deleterious, and some times severe.

An Epidemic of Noma.—(*Am. Jour. Med. Sci.*, May, 1910). Neuhof reviews an epidemic of noma which occurred in the New York Infant Asylum in 1909. This epidemic complicated an epidemic of measles. The epidemic of measles was severe eighty-one cases, 13 of which developed diphtheria and 24 pneumonia, 20 had a severe ulcerative stomatitis. There were eight cases of true noma and three doubtful ones.

He concludes from his observations that noma usually appears in epidemic form; its contagiousness is unproved. The disease is an entity and not a later form of ulcerative stomatitis. There is regularly present in noma a streptothrix characterized by a thick meshwork of mycelium at the border line between normal and necrotic tissue; fine rods and spirilla extend from the mycelium into the adjacent tissues. The constant presence of this streptothrix to the exclusion of other organisms, indicates that in all probability, it stands in direct etiological relationship to noma.

Alterations in Stools as Indications for Change of Food in Infants. (*Med. Fort-nightly*). Zahorsky says that the change of the color to a pale or even a dark green indicates that the bilirubin of the stool has been oxidized to biliverdin. Since putrefactive processes would change the yellow bilirubin to the colorless hydrobilirubin; and as bacterial activity is strongest in the colon, the usual condition which favors the green stool is that the intestinal contents have been hurried through the colon. In breast fed infants the green stool may be persistently present without affecting the health or growth of the infant. The green stool of the baby who is starved still remains unexplained. Grass green stools containing much mucus are symptomatic of follicular enteritis.

The grey or clay colored stool is generally regarded as one deficient in biliary secretions, but this is not true, but rather indicates excessive intestinal putrefaction and while depending on an excess of protein is very much aggravated by an excess of fat. The putrefaction may be greatly modified by adding milk sugar to the food.

The hard, dry stool is usually light in color. It depends on an excess of calcium soaps in the stool and a slow advance through the colon. If the stool has an offensive odor, it indicates that putrefaction is going on. The treatment of the hard, dry stool is to reduce the fat and increase the soluble carbohydrates. Light brown sugar serves as a good substitute for cane sugar.

The liquid stool usually indicates excessive bacterial activity in the inintestinal canal, especially fermentation.

The mucus stool indicates that an irritant is present in the colon and occurs in a variety of conditions. It is always present after a brisk cathartic.

Rectal Gonorrhea in Childhood.—(*Munch. Med. Wochens.*, May 3, 1910). Kaumheimer states that involvement of the rectum may be the cause of persistence of a vulvo vaginitis in girls. The infection occurring from time to time after the vaginal lesions have been cured. Rectal gonorrhea seldom showing any clinical symptoms thus avoiding detection.

Riga's Disease.—(*Gaz. des Hop.*, 1910). Pironneau records a case in a boy nine months of age in whom the lesion had destroyed the frenum and was invading the tip. The ulcer was probably of traumatic origin.

Ileus in Children.—(*Arch. f. klin. Chir.*, XCI, 4). Alapy from a study of forty-five cases from a few weeks to fourteen years of age states that in older children the conditions resemble those in adults, but in younger ones more is to be learned from palpation. Megacolon and invagination occur almost exclusively in children and are easily recognized. There were only five cases which did not belong to either of these classes. In ten cases preceding appendicitis was responsible for the ileus. The signs of invagination are always alike, and absence of rigidity in the abdominal walls is a noticeable feature. Prompt operation, doing as little harm as possible, is often essential, and enterostomy should be done more readily, perhaps, than in the case of adults. Resection is rarely necessary for invagination. If it is difficult to reduce, it is due to defective technique and not to adhesions. In many forms of occlusion of the intestine in children medical measures alone may be given a trial, but only for a short time. The permeability of the intestines became spontaneously restored after enterostomy in all of the cases of ileus from adhesions without even the necessity for separation of the adhesions.

Diseases of the Circulatory and Haemopoietic Systems.

Under the Charge of

CHARLES A. FIFE, A. B., M. D.

Instructor in Pediatrics, University of Pennsylvania; Consulting Pediatrist
Phoenixville Hospital; Pediatric Physician, Presbyterian
and Philadelphia Hospitals

A Clinical Study of a Case of Pseudoleukemia Anemia of Infancy. Theodore J. Etterich, (*Journal American Medical Association*, Vol. LV, No. 13, 1907), very briefly reviews some of the classic reports on von Jaksch's Disease and then presents the records of a case of the disease in a feeble rachitic thirteen months old boy of healthy parentage. The child had always been weak, pale and irritable. As his nourishment had been changed from one type of food to another it is probable that he had considerable digestive disturbance before his admission to the hospital. When admitted he had persistent vomiting and diarrhea and a severe bronchitis; the skin was dry and extensively dotted with purpuric spots, no bleeding from mucus membranes mentioned; icterus developed later. The cervical, axillary and incuinal glands were enlarged; the liver extended several finger breadths below the costal margin. The spleen was enormously enlarged "extending far below and to within half an inch of the umbilicus." The blood showed 45 per cent. hemaglobin, 2,500,000 erythrocytes and 27,500 white cells which are reported to consist of: Neutrophils, 6.50 per cent.; small lymphocytes, 61.00 per cent.; large lymphocytes, 18.63 per cent.; transitionals, 1.47 per cent.; eosinophils, 0.28 per cent.; neutrophil myelocytes, 1.18 per cent.; eosinophil myelocytes, 1.18 per cent.; many normoblasts. The leucytosis gradually became less until it reached 16,000, otherwise the blood conditions remained practically unchanged during the twenty-two days the case was under observation. The urine was normal until a few days before death. The abnormality in pulse and temperature was accounted for by the bronchitis and middle ear disease and later by the broncho pneumonia. The child weighed 15 1-2 pounds when first examined but lost four and one-half pounds in 22 days. Broncho pneumonia was the immediate cause of death.

At autopsy the spleen was found to weigh 163 grams (5 ounces, 15 grains) seven times more than the normal. It was firm and tough due to a remarkable growth of fibrous tissue which obliterated portions of the pulp. The blood vessel walls in the spleen were enormously thickened, especially the tunic adventitia. There were also a number of cavities which were thought to be cystic dilatation of the lymph spaces. The liver weighed 345 grams (11 ounces, three-quarter grains). It too contained an excess of fibrous tissue and showed degeneration of the central cells of the acini. Irregularly scattered throughout were larger or smaller punctate hemorrhages. No mention is made of microscopical examination of lymph nodes nor of the bone marrow. The author is uncertain whether the case is one of secondary anemia due to toxin associated with rachitis, or whether it is a distinct organic disease of splenic origin.

Pathology of Banti's Disease.—H. Luce, (*Med. Klinik.*, 1910, No. 14 and 15), describe an interesting case in a girl of seven years. There was a history of increasing weakness and anemia for six months. The spleen was enlarged when first seen, but no liver enlargement was present. Blood: Hb. 30 per cent., R.B.C. 2,100,000; W.B.C. 6,700.

While under observation in the hospital the liver was found to be enlarging and the anemia increasing (Hb. 20 per cent., R.B.C. 880,000). X-ray treatment was followed by violent vomiting and could not be continued. An intercurrent tonsillitis caused a temporary betterment of the symptoms. After eleven weeks of hospital treatment when various conditions such as syphilis, pseudoleukemia, etc., were eliminated, the spleen was removed at operation. A rapid improvement followed—the liver decreasing in size, and the blood picture becoming normal. At the present time, one year after operation, the child is in good health. The spleen weighed 240 grams and showed microscopically a relative atrophy of the lymphatic elements of the pulp, marked congestion of the sinuses, and follicular hyperplasia. The iron content was normal. The author is of the opinion that the cause of the anemia in Banti's Disease is not an increased cytolysis of the erythrocytes in the spleen, but that it results from a plasmotropic toxin injury of the red cells, and further that the development of red cells is retarded in the bone marrow under the influence of the splenogenous blood cyscrasia. It is closely related to the true pseudoleukemia and the primary focus of the condition is believed to be splenic. Tuberculosis and syphilis, Luce considers as etiological factors.

Phagocytosis of Red Blood Cells After Transfusion.—J. Gardner Hopkins, (*Archives of Internal Medicine*, Vol. 6, No. 3, p. 270), in the peripheral blood of a man in whom transfusion had just been performed because of an extreme progressive anemia resembling the primary pernicious type, found a great number of polymorphonuclear neutrophil leukocytes containing from one to six red blood cells. Before operation the blood showed 14 per cent. hemoglobin, 700,000 red cells, and about 2,000 white cells with 56 per cent. lymphocytes; many poikilocytes, normoblasts; myeoloblasts and polychromatophilis. Immediately after transfusion the erythrocytes increased to 1,700,000 and the hemaglobin to 35 per cent. The differential count was: polymorphonuclear, 54 per cent.; lymphocytes, 43 per cent.; large mononuclears, 1.4 per cent.; myelocytes, 1 per cent.; eosinophils, 0.2 per cent.; unclassified, 0.4 per cent.; a great number of normoblasts and myeloblasts and one supposed megakaiyocytes. Ten per cent. of the polymorphonuclears contained one red cell and about six per cent. contained two or more. Leukocytes were vacuolated. Six hours after the operation the patient developed a hemeplegia and died three hours later. Because of the morphology and the staining properties of the ingested red cells the author thinks they came from the donor; while the great number and the atypical character of the phagocytes convince him that they came from the recipient. Two causes of the phagocytosis are suggested: a washing out into the peripheral blood of phagocytes from the blood destroying organs or as a phagocytosis due to the presence of a hemopsonin in one of the serums. Although no opsonin was detected in the post mortem serum this does not exclude the possibility of the presence of an opsonin in the recipient's serum before transfusion. This case suggests the advisability of testing for opsonins as well as for lysions and aggtutinims when transfusion is proposed.

Hemorrhagic Disease of the Newborn With Special Reference to Blood Coagulation and Serum Treatment.—H. Schwartz and B. Ottenberg, (*Amer. Med. Sciences*, July, 1910), in an interesting paper, report two cases of multiple hemorrhages in infants and discuss the pathological physiology of the blood coagulation in these cases. Case 1, in an infant of eleven days showed multiple hemorrhages since the eighth day. Slight icterus present. Blood taken on the eleventh day showed no tendency to coagulate. 10 c.c. of horse serum were injected without effect. Transfusion was then done and the blood showed an increase in HB. from 30 to 90 per cent. with a coagulation time of three minutes. The hemorrhages stopped. In about six days the symptoms reappeared and the coagulation time lengthened. There was probably a septic infection in this case (otitis developing). Case 2, showed multiple hemorrhages in an infant of four weeks with congenital syphilis. Blood culture sterile. Had bleeding from nose one week, and was vomiting blood. Died a few hours after admission. The cerebro-spinal fluid was hemorrhagic and gave positive Wasserman reaction. The blood showed practically no tendency to clot in five hours. The authors then discuss the physiology of coagulation and quote experiments which lead them to believe that bacterial infection is the most frequent underlying cause. From both theoretical views and practical experience they think the use of serum infection is of doubtful value, but believe that transfusion should be given a further trial.

The Effect of Diminished Blood Supply to the Intestines Upon the General Circulation.—E. T. Longcope and A. T. McClintock, (*Bul. of John Hopkins Hospital*, Vol. XXI, No. 234, p. 270), by frequently repeated experiments prove that compression of the superior mesenteric artery will cause a rise in the general blood pressure of from 8 to 22 m.m. of Hg., with an average of 13.5 m.m. of Hg.; and that compression of the cocliac axis will cause an average rise of 14 m.m. of Hg. When these arteries are simultaneously constricted the rise is from 18 to 40 m.m. of Hg. This increase in pressure is not permanent but may be sustained for more than an hour. Most exhaustive experiments were made to determine whether this phenomenon is due to a reflex from the acutely anemic intestines thus causing a contraction of the vessels throughout the body; or whether it is simply due to the greatly increased amount of blood thrown into the general circulation after the legation of vessels of such capacity as the superior mesenteric and the cocliac axis and their branches. These researches clearly prove that there is no compensatory constriction of the other vessels and that section of the splanchnic nerves do not prevent the elevation of pressure, hence the rise cannot be dependent upon a reflex. As intravenous injections of blood cause a sustained increase of pressure due to bulk of fluid it is believed that ligation of the superior mesenteric and of the cocliac axis produce the same effect by relatively increasing the amount of blood in the general circulation. The pressure does not fall until the excess of blood accumulates in the ramifications of the splanchoric vessels by way of the collateral anastomosis.

Diseases of the Respiratory System

Under the Charge of

W. C. HOLLOPETER, A. M., M. D.

Professor of Pediatrics in the Medico-Chirugical College; Pediatrist to the Medico Chirurgical and Philadelphia Hospitals; Pediatric Physician to St. Joseph's Hospital, Philadelphia.

Subcutaneous Injections of Oxygen in Cases of Asphyxia.—In cases of asphyxia Ramond, (*Le Progress Medical*, Paris, September 3rd, 1910), has found that injection of oxygen into the subcutaneous celular tissue will in many cases save life and even give remarkable results where death has been imminent.

He finds that it is helpful in all forms of asphyxia, either mechanical, or due to poisons elaborated within or without the organisms, particularly is this true for pneumonic cases.

The giving of the injection is exceedingly simple, care only must be taken that the oxygen is not injected into a vein. The amount injected is one litre and may be repeated two or three times daily.

Subacute Broncho Pneumonia Pseudo Tubercular.—Under this heading Dr. Hutinel, (*Le Journal de Medecine et de Chirurgie*, Montreal, September 10th, 1910), speaks of cases which after fifteen days show rapid loss of flesh and cachectic conditions, but do not give any tubercular reaction. The diagnosis is difficult, and the signs of consolidation erroneous. We have to do with a dilatation and suppuration of the bronchioles and at times the alveoli themselves, without its being tubercular in origin. These cases are very slow in their course, do not have high fever, and most frequently follow measles. Only with the most perfect hygien will recovery take place and then only with dilatation of the bronchiole, they are subject to frequent attacks of bronchitus.

For treatment can be tried inunctions of collargol and sub cutaneous injections of electrargol.

The Diagnosis of Incipient Pulmonary Tuberculosis.—Henry Hubbard Pelton, New York, discusses the methods to be used in obtaining an early diagnosis of incipient pulmonary tuberculosis. The first is a complete history, the important points being contact with other cases of tuberculosis, and occupations that predispose to tuberculosis. Physical examination of the chest will relate principally to the auscultation of rales, and breathing, and voice sounds. The toxemia of tuberculosis will give fever and pulse changes. Sputum examination will give important evidence when positive, but none when negative. The cutaneous tuberculin test is the only one permissible and at the same time valuable. The X-ray enables us to locate the lesion after its existence has been diagnosticated. A tuberculin injection will be a last resort.—*Medical Record*, October 1, 1910.

Tuberculosis in Childhood.—In a paper on Tuberculosis in Childhood Dr. Pogue makes a plea for the more thorough spreading of the knowledge of the care and treatment of the tubercular in order to prevent its spread to the children; for as he says it is proven that it is spread from the dried sputum and will infect the child as quickly as the adult, either through the respiratory or digestive tract. These facts should be presented to the student body in such a manner as to create confidence in prophylaxis, not phthisiophobia.—*The Practitioner*, October, 1910.

Pleurisy.—In a comprehensive paper on pleurisy, Hall brings out a few points of difference between the adult type and that seen in childhood.

The temperature is higher than in the adult, or above 102° F. Pain is a much less common symptom. The onset of the disease is sometimes ushered in by vomiting. Clubbing of the fingers, seen more particularly in cases of empyema, it usually disappears with the clearing up of the disease. Marked displacement of the cardiac impulse is rarely seen owing to the yeilding thoracic walls in children. It is important to bear in mind that in children breath sounds can usually be heard even when there is a large pleural effusion. He states that exploritory puncture should always be made in any case of difficult diagnosis, where effusion is thought to be present; also that it is well to treat all cases as being of tubercular origin. Special stress is laid to the early treatment by poultice or mustard applications to the chest, or strapping the affected side. Early a milk and broth, later with effusion and a fall of temperature a fairly dry diet. Sodium salicylate in the acute stage; for absorption potassium iodide and quinine.

The indication for aspiration is urgent dyspnoea or a large effusion. Contra-indication to early aspiration is high temperature. During convalesence patient should be fed carefully and lead an out door life for several months.

Empyema should be treated by incision and free drainage.

Chronic Hoarseness.—In discussing this subject, Tilley takes up briefly the various conditions and diseases to which chronic hoarseness is due. Those during childhood being:

1. Congenital syphilis where the hoarse cry occurs within a few weeks after birth or during the earlier years of life; they should be treated by grey powder and mercurial inunctions. Special care being taken to keep the infant well nourished and warm.

2. Papillomata of the larynx are to be looked for in children of from four to ten years where there is prolonged loss of voice. Unless there is much occlusion of the glottis by many growths there will be little difficulty in breathing but cough will be present. The papillomata must be carefully and thoroughly removed but even then may reoccur.

3. Congenital syphilis at puberty manifests itself as ulceration and

cicatrisation in the walls of the larynx, and should be treated by the internal administration of potassium iodide and mercury.

The following rule will be helpful: "Every case of chronic hoarseness demands a skilled examination of the larynx."

Infectious Diseases

Under the Charge of

MAURICE OSTHIEMER, A. B., M. D.

Instructor in Diseases of Children, Univ. of Penn., Physician in charge of the Children's Dispensary of the University Hospital; Assistant Physician to the Medical Dispensary of the Children's Hospital Philadelphia.

Rheumatism in Children.—W. H. Hawley, (*Lancet-Clinic*, June 4, 1910), tells of the varied manifestations of rheumatism in children, a few cases now exhibiting any joint inflammation. He considers heredity and infection of value in the etiology. Erythema nodosum, subcutaneous nodules, tonsillitis, chorea, dyspnea on exertion and endocarditis are all important symptoms. The onset is not very acute; the temperature is not very high; few or no joints are involved; pain is moderate; cardiac complications are very common. In the treatment, which should be begun very early, before the heart is affected, absolute rest in the recumbent posture is imperative. The child should be covered with a blanket; no solid food should be allowed and meat should be excluded. Fruits, fruit juices, cereals and much water are to be given. Inflamed joints should be at rest, wrapped in cotton and lightly bandaged. The skin, kidneys and bowels must be kept active. The ice-cap to the head and over the heart may be used; also sponging with tepid water. Salicylates should be given for a short time, followed by bicarbonates, kept up for a long time. After an acute attack, it is important to avoid indiscretion of diet, exposure and over-exertion.

Etiological Factors in Scarlet Fever.—Jay F. Schamberg, (*Pennsylvania Medical Journal*, June, 1910), says that, while streptococci are found in great numbers in normal throats, they have been proved to cause numerous complications only, in smallpox as well as in scarlet fever, and not infrequently they lead to a fatal termination. But the infective agent of scarlet fever remains as yet unknown. Scarlet fever is uncommon under one year of age; and after puberty the susceptibility is enormously diminished. It is most common from two to five years of age; then from five to ten years and less from 10 to 15 years. Burns and surgical operations seem to predispose to scarlet fever by specifically lowering the resisting powers of the patient. For the resisting power of the individual at the time that the parasite finds lodgment in the upper respiratory tract is the factor of most importance as bearing upon the chances of infection or immuntiy. It is much more probable that the infective agent is not to be found in the scales, but in the discharges from the mouth, nasopharynx, ear and vagina.

Diphtheritic Cardiopulmonary Paralysis.—Mutel, (*Annales de Medecine et Chirurgie Infantiles*, August 1, 1910), reports an interesting case of paralysis of the larynx, heart and lungs, occurring on the fifteenth day of mild attack of diphtheria in a boy ten years old. He had received 70 c.c. of antitoxin in three days. He was kept propped up in bed to prevent suffocating, and strychnine was given continuously, by subcutaneous injection, for two weeks. Mutel believes that the paralysis was due to endotoxins and therefore any more antitoxin would not have helped. The boy recovered by the end of three months.

Vincent's Angina; Report of seventy-three cases.—M. L. Holm, (*Journal of the Michigan State Medical Society*, August, 1910), has examined 265 cases of suspected diphtheria at the laboratory of the Michigan State Board of Health during the past year, studying in each case the sterile cotton swabs and cultures made from them on fresh Loeffler serum. In every case diagnosed clinically as diphtheria, two or more swabs were examined. He has recorded the presence of the diphtheria bacillus whenever found; of other organisms the predominating one is given. The fusiform bacillus was recorded only when more numerous than other organisms upon smears made directly from the swabs. Of the 265 cases examined, 118 showed diphtheria bacilli in varying numbers while fusiform bacilli were found in 73 cases. The clinical diagnosis of diphtheria was made in 99 out of the 265 cases. Bacteriologic examination of these 99 cases showed diphtheria bacilli present only in 64 cases. Of the 35 cases of pseudodiphtheria, staphylococci were found in 14, streptococci in 13. Smears from these 35 cases showed fusiform bacilli in 27. Of the 73 cases in which fusiform bacilli occurred, 33 were in males, 40 in females. Ages varied from two to 55 years, the average being 18 years. A membrane was described in all but four cases, involving both tonsils in 38, one tonsil in 31 and extending to adjacent structures in 15. The clinical diagnosis of diphtheria was made in 28 of these cases, only one of which showed diphtheria bacilli; suspicious diphtheria in 20; tonsillitis in 17; Vincent's angina in five and scarlet fever in one. Results of cultures showed streptococci in 29, staphylococci in 20, diphtheria bacilli in 14, miccrococcus catarrhalis in eight; pneumococci in one and Hofmann's bacilli in one.

The Treatment of Diphtheria, Scarlet Fever and Measles.—S. R. Leahy, (in a paper read before the Suffolk County, N. Y., Medical Society April, 1910), details the method of treatment carried out at the Willard Parker Hospital for Contagious Diseases, New York City. Every case is vaccinated upon admission. In all cases of diphtheria, cultures are made from the throat on admission and when there is nasal discharge, from the nose also. Antitoxin is also given on admission, 3,000 to 20,000 units, varying from mild to septic cases, given in the axilla or at the level of the eighth rib, slightly posterior to the posterior axillary fold. Nose, mouth and throat are irrigated with normal salt solution every two to four hours. An ice collar is applied when cervical and submaxillary glands are enlarged. When the glandular swelling is very great, fifty per cent. ichthyol ointment is also applied. Purulent cases will need incision and drainage. Calomel, followed by a saline or castor oil is ordinarily given; whiskey, strychnine, intubation or tracheotomy may be needed. Cases remain isolated until two cultures, taken on successive days, prove negative. All cases of scarlet fever receive 1,000 units of diphtheria antitoxin on admission and a culture is taken from the throat, and another from the nose, if it is discharging. Nose and throat are irrigated as in diphtheria. The urine is examined daily for a week, every second day during the second week and then twice weekly. Warm baths are given every morning and the hands and feet are rubbed with pumice stone. These cases are isolated 35 days or more. Cases of measles receive a warm bath every morning also; and pumice stone is rubbed on the hands and feet. They are isolated 21 days.

Treatment of Smallpox.—C. H. Wurtzen, (*British Medical Journal*, August 6, 1910), advises keeping all patients with small pox in the dark or in a room into which only red light penetrates; even the adjoining corridors should be impervious to daylight. If the doctor needs light, a candle should be used and for as short a time as possible patients often find constant red light unpleasant, as it causes a feeling of heaviness and headache and is very tiring for reading. For the nurses entering and leaving this room, green, blue or smoked glasses are provided, to overcome the natural hypersensitiveness of the retina, due to the red light.

Epidemic Cerebro-Spinal Meningitis.—H. Richardiere and E. Merle, (*Bulletins de la Societe de Pediatrie*, June, 1910), report ten cases of epidemic cerebro-spinal meningitis in children, all except one recovering perfectly upon serum treatment. That one had a hemoplegia remaining. In one of the children an eruption of typical typhoid spots appeared on the seventh day, disappearing entirely in three days.

Pustular Typhoid Roseola.—C. Eggleston, (*New York Medical Journal*, September 10, 1910), reports the case of a patient with typhoid fever who had about 15 spots, varying in size from two or three to 10 or 12 m.m., The large spots contained a central yellow pustule, tender on pressure. This eruption was limited to the front of the body. Cultures from the pus developed a pure growth of staphylococcus aureus. Eggleston notes that the patient's skin was noticeably clean, free from all skin diseases. Recovery resulted after a mild attack of typhoid fever.

Estivo-Autumnal Malaria.—G. D. Marshall, (*Journal of the Indiana State Medical Association*, May 15, 1910), reports two cases of malaria in men of 30, both of whom died. Both patients had had many tubercular symptoms; autopsy was only performed upon one. In both cases plasmodia were found in the blood. Marshall does not believe that he has ever succeeded in completely clearing the blood of the parasites when treating cases of malaria.

Syphilis in Infancy.—E. F. Cushing, (*Medical Era*, (no date on pages) 1910), found that only about one per cent. of all infants and children brought to the Lakeside Hospital Dispensary, Cleveland, were syphilitic. These statistics show how great must be the early mortality among syphilitic infants. Whenever syphilis is suspected, blood from the placenta or umbilical cord should be examined for the spirochaeta. Most syphilitic infants, if not born dead, show typical symptoms. Others may appear healthy at birth, but develop coryza, skin eruptions, laryngitis, scanty hair and varicose veins on the scalp, paronychia, hepatic and splenic enlargements, pseudoparalysis and lesions of the brain and cord. The presence of some of these symptoms will make the diagnosis probable and to find the spirochaeta will make it certain.

The Cries of Infants With Hereditary Syphilis.—G. Sisto, (*Archives de Medecine des Enfants*, August, 1910), comments on the continuous, day and night crying of nursing infants with congenital syphilis. He considers that there is pain, usually in the epiphyses, due a syphilitic osteochondritis; when treated by mercury crying soon ceases. He has observed 13 cases, varying from two to forty days of age; they all cried whenever moved and usually most of the night

Vaccines in the Bacterial Infections of Infants and Young Children.—E. M. Sill, (*Medical Record*, August 6, 1910), in a preliminary report, tells of treating 49 cases by vaccines. Thirty-nine of these were cases of subacute or chronic otitis media, of which 28 recovered, 10 improved and one did not improve. Two cases of suppurating cervical glands and two of multiple abscesses of the scalp also recovered. One of the two infants with pneumonia had the crisis on the third day; in the other there was marked improvement. Two infants with erysipelas, eight days and one year of age, recovered; a case of acne which had lasted eight years recovered in six months upon 30 injections, and one of gonorrheal ophthalmia, aged three weeks, also recovered. The earlier the vaccine was used, the more rapidly did recovery result. He used from 200 to 800 million staphylococci every two or three days; from 40 to 80 million streptococci every one, two or three days; 40 million pneumococci every day or two; 20 to 100 million gonococci once a week or oftener. Sill is enthusiastic over his good results.

Orthopedic Surgery.

Under the Charge of

GILBERT L. BAILEY, M. D.

Orthopedic Surgeon to Oak Park Hospital, Oak Park, Ill.; Orthopedic Surgeon to Cook County Hospital, Chicago, Ill.

Tubercular Hip Disease, Tubercular Spondylitis and Psoas Abscess. H. Augustus Wilson, M. D., (Reviews of the Therapeutic Measures that have been successfully employed in the Departments of Orthopedic Surgery in Jefferson Medical College Hospital, in *The Therapeutic Gazette*, July, 1910), He states very clearly the benefits derived from the weight-bearing, ambulatory treatment of tubercular ostitis of the hip and brings out the necessity of treating cases of bone tuberculosis with the same general measures of feeding, fresh air, etc., as used in pulmonary tuberculosis. The local treatment of tubercular hip disease is the plaster spica as advocated by Lorenz extending from the level of the umbilicus to the knees, with the leg in 20° flexion, 20° abduction and about 5° of external rotation. Before the cast hardens it is modeled with the hands to fit snugly over the bony prominences. This position allows the patient to go about freely without moving the affected hip. Sinuses are treated by Beck's paste and other therapeutic measures through openings cut in the cast. The author strongly condems all attempts to break up ankylosis in the joint even in faulty positions and advises against moving the hip to ascertain whether ankylosis is present when the casts are changed. The advantage claimed by this method, over the so-called "American Method" of rest in bed with extension and later traction and immoblization: is more rapid recovery by preserving the body tone, prevention of pathological dislocations and the prevention of atrophy of hip and thigh muscles.

Tubercular Osteitis of the Spine.—Plaster jackets applied to the body is the favorite method employed in these cases, with some form of head pieces attached to the cast where the disease is above the mid-dorsal-vertebra. The proper amount of posterior leverage, which throws the body weight from the affected bodies of the vertebra to the spinous articular processes, is obtained by placing the child prone on two small benches, one supporting the head and arms, the other under the thighs. The bony prominences must be protected by felt or cotton and the cast closely modeled over the body. Psoas abscess, when causing no inconvenience to the patient and when spontaneous rupture does not seem imminent is let alone, and in many instances is absorbed or lies dormant for years. Many abscesses disappear after sojourn at the seashore.

When evacuation is necessary free incision after Treves method is used, an incision made between the ribs and the rim of the pelvis parallel to, and one and one-half inches from the spinous process of the lumbar vertebrae. This is carried down to the sac of the abscess which can frequently be exposed by pushing the erector spinal mass toward the spine. A small incision into the sac permits of slow evacuation at first, which later is enlarged to permit a complete evacuation. The cavity is douched with gallons of 1-5000 bichloride of mercury solution and then swabbed out with dry gauge sponges until dry. The erector spinal mass is then restored with catgut. No drainage or packing is allowed to remain in the cavity, which usually heals readily by primary union, 75 per cent. of cases so treated do not recur, the remaining 25 per cent, being unfavorable cases because of poor physical condition, or unfavorable bone conditions, which cause re-accumulations. This procedure is also used in tubercular abscesses demanding evacuation in other parts of the body.

The Orthopedic Treatment of Spinal Paralysis.—Prof. F. Lange, (*Amer. Jour. Orthopedic Surg.*, Aug., 1910). Prof. Lange's work in this particular field has been of incaluable benefit, and his method of tendon transplantation, to periosteum instead of the former tendon method, and the use of his silk ligature extensions have relieved many little cripples of the necessity of wearing braces. In this paper Lange reviews his methods of tendon transplantation and points out several reasons why the operations have failed when it should have been successful.

In the acute stage of poliomyelitis he strongly recommends the application of a body cast to immobilize the spine. For a year after the acute stage has passed electric currents, gently massage (he especially warns against weight, hard massage), air and various water baths are used to strengthen the weakened muscles. Orthopedic apparatus may be necessary to prevent contraction deformities, but care must be used not to injure the weakened muscles by cumbersome devices or by tightly laced splints. He uses light splints of celluloid reinforced with steel rim, which is stiff enough to hold the part in the required position without lacing.

In cases where contraction deformities are present forcible connection with plaster fixation is necessary before operation is attempted. Nerve-plastic operations for the cure of infantile paralytic deformities is ideal in theory, but limited in its application and as yet, the results obtained leave much to be desired. Arthrodesis in complete paralysis of the leg and foot is of marked benefit, but he does not recommend the operation before the fourteenth year, as too early operation reduces the prospect of bony union and favors relapse of the deformity. Instead of the usual operation, Lange uses artificial joint ligaments made of silk to fix the joints.

In transplanting tendons Lange does not attempt to replace individual muscles, but sacrifices the unimportant functions that the most important movements may be reestablished. Thus in the foot when only three muscles remain active he plants one in the oscalcis, to extend the foot, another in the cuboid bone to pronate the foot, the third to supinate it, and these last two, acting together, dorsal flex the foot, so that in this manner the four important movements of the foot are restored. The tendons of the transplanted muscles are lengthened to the required degree by the use of heavy braided silk stitched into them and the new insertions are made by sewing the silk firmly into the periosteum. This silk is treated by boiling one hour in a 1-1000 sublimate solution and afterward, when thoroughly dry in paraffin (60° C. melting point) to prevent infection.

Muscle Group Isolation and Nerve Anastoniosis in the Treatment of the Paralysis of the Extremities.—Nathaniel Allison, M. D., and Sidney I. Schwab, M. D., (*Am. Jour. Orth. Sur.*, Aug., 1910). The paper divides these paralysis into three groups.

Group I. Athetoses and spasticitics which are treated by muscle group isolation alone. The nerve trunk supplying the spastic muscle is exposed and injected with alcohol. When indicated the anatomy is also performed and deformity prevented by plaster casts, after reducement. Educational exercises and movements are used in the after treatment. Nine cases, four of which were Little's disease were treated by this method, seven reported improved, two died after operation from pneumonia.

Group II. Flacid paralysis treated by muscle group isolation and nerve astomosis. One case of traumatic paralyses of musculo spinal nerve and three cases of poliomyelitis reported.

Group III. Complicated tic movements, one case of tic of right arm and shoulder reported treated by induced paralysis from injecting the median musculo spiral and ulnar nerves with 80 per cent alcohol.

Valuable suggestions are given for the amelioration of symptoms in these helpless unfortunates for whom so little may be done, but in no other class of cases is any benefit however slight appreciated so much.

Rotary Lateral Curvature of the Spine.—Neurosmuscular exercises, done at the word of command, in the treatment of rotary lateral curvature of the spine, J. J. Neell, M. D., (*Am. Jour. of Obstetrics*, V. LXII, No. 3). A number of exercises, directions for breathing and some simple apparatus, such as weights and pulleys, inclined planes, etc., used by the author in the treatment of lateral curvature are described with photographs. Particular stress is laid on the carrying out of the exercise with military precision at the word of command given by the surgeon. It is claimed by the author that this method not only develops the muscles called into play and exerts a mobilizing influence on the vertrbrae articulations, but that it also develops more perfect control of these muscles by the higher nervous centers. He believes with Shaeffer that some nervous lesion is present in most of these cases rendering them susceptible to state influences such as habitual standing on one leg, falty positions in sitting, etc., and that the proper carrying out of the exercise at the word of command is of particular value in overcoming this nerve lesion.

The Operative Treatment of Paralysis of the Shoulder Following Anterior Poliomyelitis.—E. H. Bradford, M. D., (*Am. Jour. Orth. Surg.*, Aug., 1910). Seven cases are reported, in which part of the trapezius muscle and in several, a part of the pectoralis minor also, was used to replace the paralyzed deltoid. The transplanted muscle fibers were lengthened with silk, as advised by Lange and inserted into the periosteum at the desired point on the humerus. Fixation for several months, followed by careful graduated exercises of the transplanted muscles, gave greatly improved function in six of the seven cases.

Diseases of the Skin and Uro-Genital System.

Under the Charge of

EBERHARD WILLIAM DITTRICH, M. D.

Instructor in the Diseases of the Skin, New York Post-Graduate Medical School and Hospital; Dermatologist German Odd Fellow's Home and Orphan Asylum; Physician Northwestern Dispensary-Dermatology.

Hereditary Transmission of Syphilis.—Jos. Zeissler, M. D., (*Illinois Medical Journal*). The author has as yet arrived at no clear conception of the means of transmission of syphilis. From analogy the author concludes, that the mother plays by far the most important part in the transmission. What is termed congenital lues may be really often called conceptional lues or lues acquired during birth. A healthy woman, infected during pregnancy will transmit her disease to the offspring as late as the seventh month. Infection of the mother after this period is often without influence on the child. Often the mother suffers from frequent mis-carriages until finally children are born either dead or in a weakened condition; under proper treatment, however, the chances of the offspring are improved. Matzenaner contended that what we term immunity in the mother is really a latent form of syphilis. He substantiates this contention by ample clinical and anatomical proof. Neuman proved his objection to these conclusions by the fact, that women can give birth to healthy children from healthy men subsequently to giving birth to syphilitic children from syphilitic fathers and when the latter were treated, the offspring was healthy.

Knopfelmacher finds in 78 per cent. of mothers apparently free but giving birth to syphilitic children a positive Wassermann reaction. Rietschel another investigator finds almost 100 per cent. positive reactions. In regard to the so-called late syphilis opinions are divided.

The author personally believes that tertiary symptoms may appear long after birth.

The Technic and Value of the Wassermann Test in the Diagnosis and Treatment of Syphilis.—W. S. Medford, M. D., (*Illinois Medical Journal*). Dr. Butler and the author examined all the cases found in Cook County Hospital irrespective of the nature of the disease and found that in the cases where a positive reaction to the Wassermann was present, a history of previous syphilis was obtained. Paresis and tabes showed a positive reaction.

In all cases of primary, secondary and tertiary syphilis, parasyphilis and inherited lues the seroreaction was invariably positive.

The materials necessary for the reaction are luetic liver extract, amboceptor or sheep immunized rabbit serum, guinea pigs serum or complement, washed sheep corpuscles, specific and normal serum and the sera to be tested.

In all primary cases a positive reaction is obtained until the external manifestations disappear when it gradually becomes negative. A positive reaction indicates active syphilis present somewhere in the system. Mother's milk will show a positive reaction as well as the serum in syphilitic cases.

The Value of the Wassermann Test in Nervous and Cardiac Vascular Diseases.—Frederick K. Hans, M. D., (*Illinois Medical Journal*). In 38 cases of tabes the Wassermann test was positive in 31. Of 280 collected cases 72, six per cent, showed a positive reaction in the blood and spinal fluid.

In Paresis of 1188 cases 96.5 per cent. were positive.

This makes a valuable diagnostic sign in cases of early paresis, as a negative reaction will probably exclude this disease and suggest neurasthenia.

Circulatory disease found in cases of tabes is possibly due to syphilis.

Mracek in studying the pathological changes in the heart of congenital syphilitic infants, found extensive interstitial changes in a number of cases.

Endocarditis of specific origin is more common than hitherto suspected. In aneurism, one of the innominate artery and 25 of the aorta, 23 showed a positive reaction to the Wassermann test. This is also true for a large number of aortic valve disease and for a few mitral affections.

Have We Made Any Progress in the Treatment of Gonorrhea?—L. Bolton Bangs, M. D., (*American Journal of Medical Science*). The author thinks that we are now better able to mitigate the sufferings of the acute stage. There are fewer complications and diminished liability to develop them. There is less tendency to the formation of strictures. According to the statements of the best authorities this disease can be cured at present in from four to six weeks and even sooner by the irrigation method of treatment.

The most effective remedies of the present day are the silver preparations such as protargol, argyrol and nitrate of silver. Potassium permanganate and the astringents (sugar of lead).

Now that we look upon the urethra as a highly sensitive organ, real progress has been made in conquering its most important affection, gonorrhea.

Fissure in Ano in Children.—Martin L. Bodkin, M. D., in (*Amer. Jour. Dis. Women and Children*). Infants who are fat and constipated from a faulty diet are the most frequent sufferers from fissure in ano. Besides this a fissure may be caused by congenital narrowing of the anal orifice, eczema, diarrhea, syphilis and catarrhal diseases of the rectum.

The treatment in mild cases should be palliative. This consists of relief of constipation, cleanliness and either mildly astringent applications such as Hamamelis or applications of nitrate of silver.

Pure ichthyol is an excellent application.

Radical treatment consists of dilatation and stretching of the spincter and incision of the sphincter through the fissure or on either side if it be possible.

The Wassermann and Noguchi Complement Fixation Test in Leprosy.—Howard Fox, M. D., (*American Journal of Medical Science*). Summarizing the results of 38 cases of the tubercular and mixed types the reaction to Wassermann tests were negative in seven cases, weakly positive in 21, and strongly positive in seven cases.

Of the 22 maculo-anaesthetic and purely anaesthetic cases, the reaction was negative in 19, strongly positive in one and positive in two cases.

From this it will readily be seen, that the reaction occurs chiefly in the tubercular and mixed types of leprosy.

Wassermann reaction (Noguchi Modification) in Pellagra.—Howard Fox, M. D., (*N. Y. Medical Journal*). In three cases tested, each four times, only one showed a strongly marked positive reaction and in this case a previous attack of syphilis was probable. Two cases showed a moderate reaction and in five other cases the reaction was only weakly positive.

That the case described is an undoubted one of Pellagra would appear from the history of recurrent eruptions upon the typical sites, loss of appetite with attacks of diarrhea and weakness, a red tongue, severe mental depression, exaggerated reflexes and general arteriosclerosis. An eosinophilia of 7.4 per cent. was noted in this case.

Personal Observation of Skin Lesions of Pellagra.—Howard Fox, M. D., (*N. Y. Medical Record*). Having studied some forty odd cases of this disease, he agrees with Dr. Watson as to the characteristic symmetry of the lesions, but not as to the color, for this in white persons changes from bright red to a dull red and later to a yellowish brown. No one color can be said to be typical of this lesion.

Another characteristic feature is the sharply circumscribed border, seen most frequently upon the neck and hands. The so-called neck band of Casal is absolutely distinctive.

Comparatively few cases showed lesions on the face.

In a few instances pustulation constituting the so-called wet cases was seen, while fissuring especially over the knuckles was frequently noted.

The cutaneous manifestations of pellagra in themselves are rather a harmless and unimportant feature of this disease.

Acute Pyelitis in Children.—George B. Philhower, M. D., (*Journal of the Medical Society of New Jersey*). The disease has been up to the present era overlooked by the old time physicians. Most of the cases occur in girl babies, who have been rendered susceptible by a previous or existing attack of influenza. The bacillus coli communis is the most frequent germ found and sometimes the baccillus of influenza may be the exciting factor.

The invasion of the bacillus occurs in three ways. 1. By direct transmission from patients' bowels to kidneys through the tissues. 2. By the blood currents. 3. Most frequently along the genito-urinary tract from external causes.

The onset of the disease is often sudden with rigor, pallor and very high temperature. The urine contains pus and should be centrifuged before it is examined. The usual blood picture of pus is present. Treatment is very efficient.

Citrate of potassium in large doses will within a week cause a drop of temperature to normal and a marked improvement of all the symptoms. Urotropin plus benzoate of soda every three hours is even better in cases due to the colon bacillus.

Large rectal irrigations should be given. The resulting anemia is often of the pernicious type and convalescence is long and the patient should be very carefully looked after during this trying period.

Gonorrhea in Children.—Ada E. Schweitzer, M. D., (*Indianapolis Medical Journal*). The author believes that most cases of gonorrhea in children are due to assaults by degeneration and also to accidental infection from gonorrhoeal discharges in adults, communicated by means of towels, soiled linen, etc.

Epidemics in hospitals occur because the disease is often unrecognized and is transmitted from one child to another.

The disease lasts longer and recurrences are more frequent than in adults. In female children the vulva and urethra are most frequently involved and more rarely the fallopian tubes.

Complications and sequela are common and usually severe. Future sterility is often the result. A very efficient method of treatment is the introduction into the vagina of a guaze wick, saturated in a 5-10 per cent. solution of ichthyol or 4-10 per cent. argyrol. Vaccines are sometimes useful.

Gonorrheal Vulvo-Vaginitis, its Specific Treament and Prophylaxis.—Wm. J. Butler, A. M.,M. D., (*Interstate Medical Journal*). Among the serious epidemics that reach children's hospitals is gonorrhea. Once rooted in a hospital it is a difficult problem to remove it. This disease is an exceedingly intractable disease. With the methods hitherto used cases stay active throughout months even with the instillation and antiseptic douche treatment. Therefore the writer began to use the monovalent vaccines of killed gonococci using stock preparations. These he finds very satisfactory, inasmuch as he has treated 12 acute cases with 75 per cent. recovery and 13 chronic cases with 85 per cent. recovery The amount of vaccine injected was guided and controlled by coinciding opsonic index studies of each individual case. An injection should be given at least every fifth day. The best results were obtained by a dose of 5-50 millions. However, good clinical results will follow almost any dose.

B. Walter Hamilton is cited as treating 84 cases of gonorrheal vulvovagnitis with a cure in 90 per cent. in 1.7 months, whereas in the older methods of treatment of 260 cases only 60 per cent were cured in 10.1 months.

The most efficient prophylactic measures in hospitals is the isolation of cases, all being examined by smears and the wearing of sterile rubber gloves by nurses, who change the children's napkins.

BOOK REVIEW.

Infectious Diseases, a practical text book, by Claude Buchanan Ker, M. D., F. R. C. P., (Edinburgh), Medical Superintendent, City Hosptial, Edinburgh, and Lecturer on Infectious Diseases to the University of Edinburgh. Very fully illustrated by 66 charts and 11 colored plates and direct colored photographs. Crown 4to; 537 pages. Price $7.00. Oxford University Press, 1910, 35 West 33rd Street, New York City.

The personal note which prevades this excellent book, showing intimate acquaintance and continued experience with the infectious diseases, makes each chapter readily readable, whether taken up for general persual or turned to for the purpose of reference. Most space naturally is devoted to typhoid fever, with diphtheria and scarlet fever closely following. There are also chapters upon smallpox, measles, typhus fever, erysipelas, whooping cough, German measles, vaccinia, chickenpox, mumps, cerebro-spinal meningitis and relapsing fever. An introductory chapter discusses in a general way such subjects as bacteriology, infections, toxins, immunity, fever with its symptoms, stages, management and treatment, serum and vacine treatment, the diet in fever, the diagnosis of the eruption and prophylaxis. The final chapter on "Fever Hospital Problems" affords much interesting ststistical material for anyone who has to treat many infectious diseases.

Dr. Ker advises stripping the patient when examining a suspicious case of eruption, advice too often disregarded by the busy practitioner. He also calls attention to giving sufficient food and stimulation to support the strength of the patient with an infectious disease; food should be given "little and often." The toilet of the mouth is also important in these fevers. Dr. Ker has seen undoubted cases of very high temperature followed by recovery and refers to several cases with 107.5° F. during a rigor; one patient reached 109° several times and on two occasions exceeded 110° F. (page 10). He emphasizes the fact that patients with high temperature seem to recover better than those in whom the reaction is less well marked. The cause of the temperature, i. e., the toxemia, should be treated. When this is impossible, hydrotherapy is indicated. He prefers hot to cold water in the eruptive fevers. He does not use any antipyretic drugs, not even quinine. Everything should be done to favor elimination; insomnia must also be treated, preferably by tepid sponging, hot drinks and few drugs.

The methods of treatment described by Dr. Ker are thoroughly modern as is the time limit of isolation; in scarlet fever, a detention of at least six weeks from the onset of the disease or so long as any discharge from nose, ear, vagina or suppurating wound persists; in diphtheria, until two cultures, taken on successive days, prove negative. The colored plates are excellent and will greatly help the inexperienced practitioner, when in doubt as to diagnosis. The only thing lacking to make the work entirely up to date is a chapter upon "Poliomyelitis," a defect which will in all probability be remedied in future editions, as epidemics of this disease surely occur in Edinburgh.—*Ostheimer.*

Diet in Infancy, the essential introduction to the study of diseases in childhood, by A. Dingwall-Fordyce, M. D., F. R. C. P., Ed. Extra Physician to the Royal Hospital for Sick Children, Edinburgh. Edinburgh and London, William Green & Sons, 1908.

This is a modern treatise on all methods of infant feeding, substitutes for mother's milk, artificial feeding in the sick and healthy infant, with rules and formulae for the preparation of different foods. It is offered for the conideration of general practitioners in medicine, as well as to medical students upon whose responsibility rests the future welfare of the large majority of children. The subject matter is well brought out and well expressed and as easily grasped and will serve as a reliable guide to students and young beginners in medicine.

The Nutrition of the Infant, by Ralph Vincent, M. D., member of the Royal College of Physicians; senior physician to the Infant's Hospital, Westminister. Third edition. Demy. 8 vo. pages 342, twenty-five illustrations. Price $2.50, cloth. London, Bailliere, Tindall & Cox, 8 Henriette Street, Covent Garden, 1910.

Dr. Vincent realizes the great importance of a thorough understanding of the subject of infant feeding, and its great value to the general practitioner, and lays special stress upon the question of nutrition in this handy little volume. He realizes the futility of expecting any form of substitute, or artificial feeding to give results that could be at all comparable with breast feeding.

The author gives to Rotch, of Boston, the distinction of having first clearly defined and outlined the most scientific plan for successful infant feeding. He says, no writer on this subject can handle it adequately without frequent reference to Dr. Rotch's work in adapting cow's milk to the infant's requirements.

Cow's milk, the making of various mixtures, the supervision of the milk supply, and the bacteriology of milk are all considered in detail and give one much food for reflection.

The chemistry of infantile digestion, the diet in relation to growth and health, "zymotic enteritis" (the heterodox ideas about this which the author entertains are, no doubt, known to most of our readers, since they have been so recently distributed throughout the medical profession in the form of a pamphlet), atrophy, rickets, and scurvy all receive minute consideration.

The author of this work is partial to the percentage method of infant feeding. Admitting its complications, he states that complexity is not greater than the facts demand. After thoroughly testing this method he has found it yields the most satisfactory results to both patient and physician, and it has, in his hands, converted the most unsatisfactory part of his practice into the most satisfactory. This and kindred subjects Dr. Vincent handles in a most satisfactory manner, presenting the latest teachings on a most difficult and important subject, in a style that is easily and readily grasped and thoroughly practical.

Though one does not entirely agree with all the teachings contained in this volume, the material is the individual experience of one who has tackled this branch of medicine in a thorough and scientific fashion, and therefore, demands our most serious consideration; and we do not hesitate to say that its perusal will benefit, and be appreciated by all physicians who are interested in infantile nutrition.

Guide to the Clinical Examination and Treatment of Sick Children. Second edition, greatly enlarged and rewritten by John Thomson, M. D., Fellow of the Royal College of Physicians of Edinburgh, Physician to the Royal Edinburgh Hospital for Sick Children. Joint Clinical Lecturer on the diseases of Children, University of Edinburgh, Hon. Member of the American Pediatric Society. With 160 illustrations, Edinburgh and London, William Green & Sons, Medical Publishers, 1908.

This is a practical handy manual, intended as a guide to the study of diseases of children, and at the same time to supply to practitioners and senior students practical, useful information, supplementing but not supplanting the larger text books, but serving as an introduction to the larger works on diseases of children. This work is, therefore, largely clinical being the gist of a series of clinical lectures delivered at the Children's Hospital in Edinburgh. The subject matter is presented entirely from a clinical standpoint, it is practical, up-to-date and thoroughly reliable and to be depended upon. The author has performed an excellent piece of work and we feel certain that the student and practitioner, as well can learn more diagnostic points from its careful perusal, than from most of the ordinary larger text books, and as such it deserves a prominent place amongst works on pediatrics.

Obstetrical Nursing for Nurses and Students, by Henry Enos Tuley, A. M., M. D., Professor of Obstetrics, Medical Department University of Louisville; Visiting Obstetrician and Lecturer on Obstetrics to Training School for Nurses, John N. Norton Memorial Infirmary and Louisville City Hospital; member Sloane Maternity Hospital Alumni; Ex-Secretary and Chairman Section on Diseases of Children, American Medical Association; Secretary Mississippi Valley Medical Association, etc. With seventy-three illustrations. Second edition, revised and rewritten. John P. Morton & Company, Publishers, Louisville, Ky., 1910. Price $1.50.

The first edition of this handy little work appeared in 1902, and owing to the fact of the original plates being destroyed this edition may well be termed a new work since every line had to be reset, which the author took advantage of when rewriting this edition. This work is intended first for the undergraduate nurse, as a text book, and for the graduate nurse to refresh her mind upon many points, and lastly the medical student and young physician can read it with profit and pleasure.

Dr. Tuley knows his subject and presents it well—in such manner as to enable the nurse to intelligently grasp the meaning and to successfully care for the cases in which she may be employed, and not merely look upon her duties as routine or machine work. Dr. Tuley does not attempt to evertrain the trained nurse, his intention being to aid her training, so that she will make an able and trustworthy assistant to the obstetrician.

The whole subject is most thoroughly and systematically covered, sufficient anatomy of the female, physiology of the sex, embryology, the mechanism of labor, the pathology of the puerperium, and the dress and care of the child, are all carefully and thoroughly discussed. A feature which will be greatly appreciated by the nurse is the very complete glossary of obstetric terms. A nurse who has mastered this little work will need no instructions from the attending obstetrician as to the details of preparing the layette or the supplies and necessities for the lying-in chamber.

Arhythmia of the Heart, a Physiological and Clinical Study by K. F. Wenckebach, Professor of Medicine, Groningen, Translated by Thos. Snowball, M. A., M. B., Burnley. With 7 plates and 20 figures in the Text. Edinburgh and London, William Green & Sons, 1904.

Irregularity of the rythm of the heart has been the *bete noire* of all observers who have essayed to analyze the irregular pulse. However in this analysis, the author makes use of the latest results of physiological research and reviews the most recent works on this subject, as well as the most recent criticisms which he combines as a whole, arranging the facts into a single compact volume. He discusses the forms of arhythmia according to their origin into certain physiological types, and the various forms that have long been recognized clinically are compared with these types. A preliminary chapter explains the theory of the myogenic action of the heart on which the analysis here given depends. In order to benefit by the teachings of this work one must be familiar with the diagnostic technique of auscultation of the heart sounds and understand their physiological and pathological importance. These and all kindred questions are thoroughly and plainly stated.

PEDIATRICS

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EDITORIAL

WEAK ANKLES.

Certainly in New York, and presumably in other large cities, weak ankles are one of the commonest of children's affections, and yet, unless of severe grade, they arouse little interest, and are usually, if noticed at all, put off with perfunctory treatment. The most popular remedy with the laity—and we fear that the profession is not entirely blameless—is the abomination known as the stiff-ankle or corset shoe, which is prescribed with a looseness and prodigality simply amazing, for any crippling disorder below the waist line. In the case of young children, brought for lameness, crookedness, or weakness of the lower extremities, to the public clinics, fully three-quarters, on a moderate estimate, come wearing stiff-ankled shoes, purchased on the advice of some interested friend, and without reference to the seat or nature of the difficulty. The advice invariably given by the writer, whether the trouble is in the ankle or not, is to discard them for shoes of the ordinary kind, properly selected and fitted.

Weak ankles are commonly a local expression of general lack of vigor and laxity of fibre—a stigma of physical degeneration—due frequently to the restrictions of city life, both general and local. In all cases they are the expression of a disproportion between the superincumbent weight and the resiliency of the structures upon which it impinges; the weaker side gives way and the foot rotates out, passes into the position of abduction, and the arch lies nearer the ground. In this position the weight of the body is no longer transmitted through the center of the ankle and foot, but falls to the inner side, tending to aggravate the evil and also to bring undue strain upon the internal lateral ligament of the knee and thus to produce knock-knee. Such a foot is an imperfectly developed foot often alluded to as "weak foot" and "flat foot," and while the tendency is toward abduction the toes do not always point outward, for the child may instinctively "toe in" to avoid the strain of the opposite position; so that weak ankles, tending naturally to abduction of the foot, are a common cause of "pigeon toes." This instinctive maneuver is protective in its tendency and affords a hint for treatment. If the foot is slightly inverted by raising its inner border, the line of impinging weight will fall in its normal position, near the middle of the foot. This can be done by adding a strip of leather, one-quarter of an inch thick, to the inner border of a well-fitted laced shoe. If the patient is delicate, as is usual, the general nutrition must be improved by better diet, less study and more exercise in the open air, and, in any case, the foot must be educated and trained by appropriate local exercises. If such measures are systematically and skillfully applied before the case has become inveterate, severer measures will not be required. The stiff-ankled shoe, though no doubt a commercial success, is a clog and hindrance to successful treatment, and should be consigned to the armamentarium of those sapient beldames of both sexes, who never know what is the matter, but invariably know what to prescribe. We commend to the attention of our readers an article published elsewhere in this issue entitled "Flat Foot and Treatment, by Theodore Toepel, M. D.," which is well worth careful study.

CHILDREN'S DRESS.

The time of the year is fast approaching when mothers begin to think of making a change in their children's clothing. Some parents, indeed, believe in rearing their offspring on the Spartan principle—by training them to undergo the changes in climate without altering the texture or weight of their garments, which form of physical education strengthens both mind and body at the same time. This method is termed the "hardening" process, and is a relic of the long passed away age when the "survival of the fittest" was a doctrine of universal belief. Now customs have changed and the object is to preserve life no matter how thin the thread may be by which it hangs. Naturally, the question of clothing children is a matter that chiefly concerns the parents, and must be left to their judgment; nevertheless, the doctor is often consulted to decide the point as to which child can stand roughing it and which one the method may injure. There are children on whom the application of the "hardening" process has the best effect, and again, there are many—and may be more—to whom such a course of training would bring disastrous results. Discretion should be exercised; the constitution of the child should be taken into account. Underclothing is the most important part of a child's dress, and it may be said, that although the material should vary in weight with the seasons, the substance should always be linen. To wear wool next to the skin is a great error in personal hygiene. With regard to the feet, the necessity of keeping them well covered and warm need scarcely be urged, and for them as for the rest of the body, linen, silk or cotton are the fabrics most suitable to envelope the feet. In fact, whatever are the views of particular members of the profession with respect to the mode of physical education, there is a great concensus of opinion in favor of linen garments being worn next to the skin. Underclothing must be in consonance with physiological principles; that is, it must be warm, absorbent and ventilating. Nature did not intend us to live in hot houses, neither did she impose clothing upon us. If we must live healthfully and allow our children to develop normally we must revert to natural conditions so far as the exigencies of civilized life will permit us. The necessity for pure air is gaining recognition, but it will not carry us far until we have recognized the equal, if not greater necessity, for rational and physiological treatment of the skin. Linen, cotton and silk undergarments can be made, and are made, so as to imprison air in their meshes. Such garments are every whit as warm as flannel over which they are superior in the possession of those absorptive and ventilating properties of which flannel is so conspicuously devoid.

THE CLOSE OF ANOTHER VOLUME.

With the present issue, the last for 1910, Pediatrics completes its twenty-second volume and in doing so the management takes this occasion to extend its thanks to the generous support of its many friends, and looks back with no little degree of satisfaction upon the year that has passed. While all its various departments have received the most careful attention, never before in its long career has it been enabled to publish such a large number of original articles,—contributions to medical science of a character of which any journal might well be proud.

For the future, there is the same, and even a more brilliant promise of greater success and no effort will be spared to make

Pediatrics, always, and in all respects, a practical, helpful journal to every doctor who attempts to prescribe for and alleviate the ills of infants and children. During the past year a great deal of time, energy, money and grey matter have been expended on Pediatrics, striving to make it worthy of the attention of the leading metropolitan Pediatrician and the general practitioner, whether his field lies in the City or the rural districts and from the encouragement received we have reason to believe that we have not labored in vain.

We hope our readers are satisfied with what has been placed before them from month to month and that they will continue to assist in the scientific uplift of Pediatrics. We also hope that each of our subscribers will speak a good word for Pediatrics among their medical friends. Pediatrics wishes to stand wholly upon its merits and there can be little question that there are many physicians who would like to subscribe if their attention was once directed to its real value. Such effort would be equally advantageous to all concerned for it is a self-evident fact that the larger the circle upon which such a publication can depend for pecuniary support, as well as for scientific contributions, the more attractive in every way it can be made. In the volume closing with this issue, we have published nearly 900 pages of text matter, being much more than any preceeding volume of Pediatrics has contained. The Editor desires to extend his thanks alike to our subscription and advertising patrons and to wish them all the seasons compliments.

THE CARE OF CHILDREN'S VOICES.

Much harm is often done to children's voices when at school. How often has one heard when passing a school building the loud sing-song hum of the children's voices reciting the multiplication tables or reading or spelling together. It would appear that to speak at the highest pitch of their voices is considered absolutely necessary by the teachers. The reason is said to be that the teachers say that unless the children are permitted to speak at their loudest they cannot raise their enthusiasm. Putting on one side the injurious effects to their voices and nervous organization from this straining and excitement the system is a mistaken one in every way. The mind works best when the body is in a state of quietude, and the surest way of attracting and holding the attention of an audience is not by screaming at the top of one's voice, but rather by lowering it and speaking in a low, distinct and clear tone. Distinct articulation will carry the notes of a voice further even when used in a low key, than the loudest shouting, and the fact has been clearly proved that a quiet, natural tone of voice is more effectual than a loud, unnatural one. More attention should be paid to this fact, as in many instances a child's voice is irremediably injured by the practice in vogue in the schools at the present time. A child's voice is more apt to be injured in the first two years of school life than at any later period, solely owing to incorrect training.

THE NOMENCLATURE OF DISEASES OF CHILDREN.

From time to time reform has been attempted in the nomenclature of diseases, with the object of improving on or doing away with the bad Latin and Greek terms now abounding. There are many who wish for new terms, as well as the proper understanding of the old words. The nomenclature of some of the diseases of children might be revised with advantage, or at least if not revised there should be agreement between English speaking doctors in respect to the expressions used when referring to these diseases. For instance, when speaking of the dyspeptic conditions of children, it is the custom with a large number of physicians to invariably make use of the general term catarrh; this may be anatomically correct, but after all it renders the disease somewhat obscure to readers. Several diseases are known by names which do not seem in the least fitting, while others appear to exactly express the nature of the complaint. What could be more expressive than the names scarlet fever, croup, whooping-cough, bronchitis? Discussion is useless over words which have been accepted and by years of use become thoroughly grafted upon the language. In a few words it may be said, that names which are most in sympathy with the genius and structure of our language, or are actually drawn from our speech, are most suitable for adoption by us. As a great authority on the subject says: "All disease names are only labels by means of which the maladies themselves can be identified, discriminated and classified, and those names are the best which are simple, distinctive and express no theories of causation. It is the folk names which most often meet these requirements, and therefore deserve the widest adoption by us in the future."

PEDIATRICS

ORIGINAL ARTICLES

FLAT FOOT AND TREATMENT.*

Synonyms—Weak Foot, Splay Foot, Talipes Valgus.

BY

THEORDORE TOEPEL, M. D.
Atlanta, Ga.

In presenting this article I realize the magnitude of the subject and my inability to do it full justice in the time allotted to me. Hence I shall touch upon the important points of the anatomy, pathology, etiology, symptoms and diagnosis briefly so as to have more time to describe the different methods of treatment including my own experience in this line of work.

Under normal conditions, in the act of passive weight bearing, the astragalus rotates downward and inward upon the os calcis, depressing its anterior and internal border until the movement is checked by the strong ligaments connecting the bones, the calcaneonavicular, the deltoid and the interosseus; in other words, the leg has a tendency to slip downward and inward from off the foot. In the flat foot the normal movement has become so exaggerated by the distension of the ligaments and by the weakness of the supporting muscles that an actual subluxation is present. The astragalus has rotated and slipped far to the inner side of its normal position, to an attitude of exaggerated rotation and plantur flexion, so that its head can be plainly felt on the internal border of the foot. The anterior extremity of the os calcis is depressed and is turned slightly inward and its internal border is lowered.

The navicular bone has been depressed with the head of the astrafalus, although to a less degree, it has been forced further away from the os calcis, and the entire border of the foot is lowered. Thus the depression of the arch is always accompanied and preceded by a bulging inward of the inner side of the foot.

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*Read before the Nashville Meeting Southern Medical Association, Nov. 8, 1910.

Supposing the foot to have been normal before it began to break down, it is evident that persistent deformity could not have been acquired without marked changes in its internal structure. The ligaments on the internal aspect of the foot and of the ankle-joint are weak and distended; the unused portions of the articular surfaces of the joints may be denuded of cartilage, while new facets may have formed to accommodate the changed relations of the bones. For example, the external malleolus may be in direct contact with the os calcis; evidence of injury and of abnormal pressure may be found in the thickened periosteum, in formation of osteophytes, while the internal structure of the bones has been changed by adaptation, to the new conditions. The muscles which are no longer used in the leverage of function, the plantar flexors and aductors, have become atrophied, a change that is made evident by the shrunken calf. The muscles on the inner border of the foot have been overstretched while those on the upper and outer part have become shortened and contracted. Such a foot represents an extreme, it may be an irremidiable degree of deformity; but in by far the greater proportion of the cases the pathological changes have not advanced to a stage that interferes with successful treatment.

In all cases the actual symptoms of pain and disability are due to a disproportion between the burden or strain and the ability of the machine to perform it.

This theory explains why the foot, which may be fairly normal in structure, breaks often in later adolescence or early adult life when the continuous strain of regular occupation is undertaken. It is evident, also that an occupation that induces a persistence of the passive attitude, that of waiters, cooks, policemen and clerks, for example exposes the feet to greater strain than one which encourages alteration of postures.

The earliest symptom in flat foot is usually a sensation of weakness; the patient begins to recognize as familiar a feeling of discomfort of tire and strain about the inner side of the foot and ankle; sometimes after long standing a dull ache in the calf of the leg or pain at the knee, hip or in the lumbar region, symptoms more common in women than in men; or after over exertion a momentary sharp pain radiating from the point of weakness. After a while the patient may become aware that he is accommodating his habits to his feet. Not infrequently early symptoms are pain and tenderness at the centre of the heel, explained in part by the jarring heel walk which is always assumed when the foot is weak, and in part by the strain upon the attachments of the deep plantar ligaments. The foot is weak and vulnerable; the patient recognizes the fact that he has what he speaks of as a week ankle, or sprain or gout or rheumatism. The range of motion becomes more and more restricted; the habitual attitude at first exaggerated to deformity only under the influence of the weight of the body remains a permanent displacement of the bones.

In examining for flat foot note the manner of standing and walking. The heel walk, the exaggerated turning out walk, the slouchy gait in which the leg is never completely extended, in which the power of the calf muscle is not applied, and in which the essential postures of the foot are disused, are elements of weakness that should be corrected whether they cause symptoms or not.

On the bare feet pay particular attention to the line of strain or leverage; thus a line drawn down to the crest of the tibia from the centre of the patella, continued over the foot, should meet the interval between the second or third toes; if it falls over or inside the greater toe, it shows that the foot is working at a disadvantage.

The exact amount of bearing surface may be shown by an imprint upon carbon paper or by smearing the sole with vaseline; then, as the patient stands upon a sheet of white paper, the outline of the foot should be traced so that the relative size of the imprint to that of the foot may be shown and compared with the normal standard. The most satisfactory method for preservation is that by Freiberg, by which an impression is made with alcoholic solution of tincture of iron and fixed with a solution of tannic acid.

In testing the foot for range of motion the dorsal and plantar flexion is to be considered, but by far the most important test is that of the power of adduction or inversion of the foot, the test of the mediotarsal and subastragaloid joints, a motion in which the os calcis is drawn forward and inward under the astragalus, while the forefoot is flexed about its head.

Treatment—The principles of the treatment which lead to the permanent cure of the weak and deformed foot are very simple, but the application varies somewhat according to the grade and duration of the deformity. The object of the treatment is to change the weak foot that it may conform not only in cantour but in habitual attitudes and in power of voluntary motion to those of the normal foot, because complete cure is impossible unless normal function is regained. The first step must be therefore, to make passive motion free and painless to the normal limit.

The weak foot, because of inefficient ligaments and muscles unable to hold itself in proper position, must be supported, in many instances, until regenerative changes have taken place in its structure. Such support is necessary to retain the joints in normal position, must be supported in many instances, until regenerative changes have taken place in its structure. Such support is necessary to retain the joints in normal position, and to hold the weight in proper relation, to the foot, otherwise normal function is impossible. When these essentials are provided the patient may cure himself by the proper functional use of the foot and by the avoidance of the attitude that place it at a disadvantage.

In practically all cases it will be necessary to provide the patient with a proper shoe, for the shoe is usually the direct cause of the minor deformity, and indirectly, in many instances, of more serious disability. A simple expedient in the treatment of the weak foot and an aid in balancing it properly is to make the inner border of the sole and heel of the shoe slightly thicker in order to throw the weight towards the outer side of the foot.

The patient's attention must be called to the three elements of weakness. First he must guard against valgus by throwing the weight on the outer side of the foot, second, by holding the feet parallel with one another in walking and by aiding the arch by the power of the great toe and by pressing down the sole of the shoe with his toes, third, he must avoid long continuance in one position, especially the passive postures, which even in the normal subject, stimulate the attitude and deformity of weak feet.

Exercise to increase the power of the deficient muscles and ligaments proper shoeing are sufficient to correct many of the milder cases. They form an important part of the treatment of all cases, medium or severe, whether or not used in connection with support to the arch, and are to be regarded as essential to treatment of any form.

The most notable deficient muscles are the tibialis posticus, the flexor, longus hallucis, and the short muscles of the sole of the foot. Among the exercises most commonly useful are the following: They should of course all be taken without boots or shoes.

1. The patient stands with the feet turned out, arises slowly on toes, turns out the heels and sinks slowly to the ground.
2. The patient walks with the feet held in the position of talipes varus, the attitude of the feet being kept up by strong muscular contraction.
3. The patient learns to flex the toes while the foot is free and to grasp objects in them by their plantar surface.
4. The patient learns to separate the great toe from the second toe laterally and to hold it in that position while walking.
5. The patient sits with the legs extended heels resting in holes eight to twelve inches apart. Forcible adduction of the forefoot is made while an assistant resists lightly by pressing against the ball of the great toe.
6. Dr. Osgood's apparatus for one foot, same exercise can be executed with the assistance of another, one hand steadies the tibia and the other presses against the ball of the great toe.
7. The patient should be taught to rise on the toes at the end of each step, finishing the step with the toes.

These and other exercises that the surgeon selects should be performed an increasing number of times each day.

Support—In many instances this simple treatment that has just been outlined is all that is required and the symptoms of tire and strain are quickly relieved but in the majority of cases the patient is not able to prevent deformity voluntarily and the restoration of the arch may be accomplished by the use of a pad of gauze held in place by adhesive plaster or by repeated stirrup strapping in a slightly adducted position. For permanent use these methods must be substituted by a plate which is made of different materials, steel, phosphor-bronze, aluminum, German silver, etc. In adults it will be necessary to use a metal plate of some kind protected from perspiration by impervious materials. This plate must be an accurately shaped brace made from a cast taken without weight bearing and slightly higher than the arch. This allows the foot some action in walking, and gently applies restoring pressure when at rest.

In addition to the gymnastic and supportive treatment it may become necessary to shorten the tibialis posticus muscle in an operative way. This muscle which in a pes valgus condition is very much stretched can not properly perform its function of supporting the hollow of the foot, and a decided shortening of this muscle will restore its normal function and also help to prevent a relapse into the pes valgus condition.

The difficulties in the satisfactory treatment of the feet which present typical and permanent deformities (rigid foot) as a class, while by no means insurmountable, will be recognized by all as considerable.

Weight bearing determines that the deformity, in practically all cases, shall be valgus, and the problem presented is to obtain a completely or partially flexible foot, capable of maintaining without or with artificial support, correct weight bearing lines.

It is advisable to make an examination of rigid feet under an anaesthetic, having obtained the consent of the patient to any corrective measures which at the time may seem wise.

(*a*) Simple muscular spasm will disappear under full anaesthesia. Contracture will be little influenced, and adhesions not at all. The commonest form I have noticed has been the spasm of the peroneals, and, although the foot be markedly over-corrected and retained for a long time in plaster, the tendency to recurrence is marked. Manular manipulation and retention in the over-corrected position and the use of specially devised plates will correct muscular contracture.

Where, in the rigid valgus cases, tendons are found to be actually contracted, they should be divided. An important point which does not always receive the attention it deserves is the tense and frequently shortened Tendo Achillis. Tenotomy or better, a lengthening of the tendon should be undertaken. It is surprising to discover the amount of resistance this tendon will offer to corrective manipulation if not cut.

(*b*) In those cases in which the rigidity is due to fibrous adhesions, from the strain of static error, from the inflammatory processes of infectious arthritis, or the results of trauma, forcible manipulation, under an anaesthetic is almost indispensable. If one is the fortunate possessor of strong hands, this may be done manually, but the Thomas wrench is usually more thorough and efficient. The Gefvert screw plate is also a very useful and efficient instrument. Even though an ominous cracking is often heard during the forced correction, caused by the severing of the adhesions, the good results after this operation are not interfered with. Now, apply a cast in the over-corrected position, which should be split within twenty-four or forty-eight hours, and the feet at first gently and later more vigorously moved, being returned to the retentive over-correcting cast. Within a week active exercises should be begun, and these procedures, uncomfortable as they often are, included if necessary anaesthesia should be persistently repeated, until the desired flexibility is obtained and can be retained under use. A supportive and corrective plate is usually a necessary addition to the treatment.

(*c*) When rigidity is due to bony anchylosis or overgrowth, we are confronted with a much more serious condition. Very forcible manipulation and "wrenching" under an anaesthetic may result in bettering the position, but will hardly restore flexibility.

If the obstruction to motion is caused by bony spurs which have their etiology in some traumatic or inflammatory lesion, their removal by open incision offers a chance of return to more normal motion. If the spurs are the result of a chronic rheumatic process of the hypertrophic type, we have no warrant that their removal will not be followed by recurrence, and palliative measures are surely wiser in most cases.

If tarsal fractures are demonstrated by the Roentgen ray corrective osteotomy, in suitable cases, is the rational procedure. Not a few cases have been met with in which, from long weight bearing strain, the head of the astragalus and sometimes the navicular bone have partially subluxated. This bulging on the inner side has represented a bony obstacle to correction, and a trying deformity. The typical operation, the removal of a wedge from the astragalo-navicular region, aims simply at removal of the deformity. It should be restricted to those cases in which the adaptive changes are so marked that functional cure is impossible.

In conclusion, the following points are again emphasized: Flat foot in its surgical sense is a compound deformity, in which the abnormal relation between the foot and the leg, causing the improper distribution of the weight and the strain and disuse of normal function, is of vastly greater importance than the depression of the arch which has given the name to the disability.

The weak and deformed foot can be cured, but only by the application of the simple principles that any mechanic would apply to a disabled machine whose structure and use were known to him. In other words there can be no permanent cure of weakness and deformity unless normal function is regained, or unless effective treatment has this end in view.

The exercise treatment of weak and improperly used feet is admitted by all to be rational and desirable. The plate that supports the foot must be an accurately shaped brace, made from a cast, this should never be left to the shoe fitter at the shoe store. Severe operations should be resorted to only when milder measures, after due trial have failed, for comparative relief will, in the great majority of cases, be obtained by the milder remedies in about six or eight weeks, whereas several months are required after any cutting operation upon the tarsal bones before the foot may with impunity be freely exercised.

929 Candler Bldg., Atlanta, Ga.

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LESIONS OF THE ISOLATED APPENDIX VERMIFORMIS IN THE HERNIAL SAC.*

BY

H. TYRRELL GRAY, M. A., M. C., Cantab, F. R. C. S., Eng.
Casualty Officer, Hospital for Sick Children, Great Ormond Street, London, Eng.

Inquiry into this subject was prompted by an unusual, and in many ways interesting case, which, by the kindness of Mr. Corner, came into my hands at Great Ormond Street about two years ago.

On the morning of August 25th, 1908, the mother, whilst bathing a male infant of eight weeks, noticed that the right side of the scrotum was swollen; the child, however, was lively and well up to the 27th, and the swelling did not appear tender. On the 27th, the medical man, in attendance for vaccinations, noticed the swelling and sent the child to hospital. The bowels acted on the 26th, and, beyond a little regurgitation of food, there was no vomiting. No hernia had been noticed previously.

On Admission.—On the right side was present a large inguinoscrotal mass, tense, hard, and tender; the skin over it was red and the percussion note was dull.

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*Paper read in the Section of Diseases of Children at the Annual Meeting of the British Medical Association, London, July, 1910, *British Medical Journal*, October 15, 1910.

There was no impulse. The temperature was 97° F. and the child did not appear ill.

Operation revealed brawny, oedematous and friable tissues which could not be easily identified, and, on opening what subsequently proved to be the sac of a right inguinal hernia, nothing but a solid mass resembling bacon fat was encountered. Imbeded in this plastic exudate lay rather more than the distal half of the otherwise free appendix vermiformis. It was acutely inflamed, kinked, and perforated all but the peritoneal coat at its distal extremity. The appendix and caecum were drawn out of the wound, appendicectomy performed in the usual manner, the sac ablated, and the wound completely closed. Recovery was uninterrupted save for the occurrence of a stitch abscess which rapidly healed.

There was no evidence of strangulation of the appendix, and the previous attempts at reduction by taxis, which fortunately failed, impressed me with the danger of practising such manipulations unless a definite opinion as to the exact nature of the lesion can be arrived at; for death has been known to follow maneuvres which, as in the present instance, were unsuccessful[1].

An examination of the literature was undertaken to ascertain the relative frequency of appendicitis to strangulation (a point on which great difference of opinion is expressed), and, further, to estimate the possibility or impossibility of suspecting the nature of the lesion, and so perhaps to minimize the dangers of routine taxis. Again, these cases are deceptive at the time of operation; the inflamed appendix, for instance, has been mistaken for the spermatic cord, left alone, and caused the death of the patient, though the rest of the contents of the sac had been reduced[1]. These cases of hernia are rare, as may be judged from the remarks of Thiery[2], who speaking in 1892, states that neither he nor Lucas-Championniere had ever seen an appendix as the sole content of a hernial sac. The differences of opinion as to the nature of these lesions is illustrated by the looseness with which the term "strangulation" is applied. Thus Knowles[3] applies this term to a clear case of primary inflammation; Quenu[4] demonstrated microscopically that his case was one of primary strangulation; Delore and Chalier[5] state that appendicitis is frequent but strangulation rare, and they deny that strangulation follows inflammation. Clogg[6] reports the successful reduction of the incarcerated appendix on fifteen occasions, and states

A.

ANALYTICAL TABLE OF RECORDED CASES.

APPENDICITIS CASES.

	Cases.	Femoral.	Inguinal.	Chronic.	Gradual Onset.	Rest.	Male.	Female.
Infants ... ... (0—3 years)	2	0	2	0	1	—	2	0
Children ... ... (3—16 years)	0	0	0	—	—	—	—	—
Adults ... ... (30—60 years)	9	5	4	5 (62 %)	6 (66.5 %)	1 (100 %)	3	6
Advanced Age ... (over 60 years)	7	3	4	5 (100 %)	4 (80 %)	1 (100 %)	4	3
Male	9	1	8	6 (85.5 %)	5 (62 %)	2 (100 %)	—	—
Female...	8	6	2	2 (40 %)	5 (71 %)	—	—	—
Actual percentage where mentioned	18	8 (44.5 %)	10 (55.5 %)	10 (81 %)	11 (73 %)	2 (100 %)	—	

STRANGULATION CASES.

	Cases.	Femoral.	Inguinal.	Recent.	Acute Onset.	Activity.	Male.	Female.
Infants ... ... (0–3 years)	2	0	2	2	2	—	2	0
Children ... ... (3—16 years)	—	—	—	—	—	—	—	—
Adults ... ... (30–60 years)	24	18	6	8 (40 %)	18 (85 %)	13 (56.5 %)	4	19
Advanced Age ... (Over 60 years)	10	9	1	9 (90 %)	8 (80 %)	4 (80 %)	0	10
Male	6	1	5 (2infants)	2 (66.5 %)	5 (100 %)	1 (100 %)	—	—
Female...	29	27	2 (1 sex unmentioned)	16 (59 %)	24 (85.5 %)	15 (88 %)	—	—
Actual percentage where mentioned	36	27 (75 %)	9 (27 %)	19 (65 %)	28 (82.5 %)	17 (68 %)	—	

that the appendix is usually free of adhesions, though Coley[7] says it is adherent in eight out of every nine cases; but such disastrous results as those reported by Bichat[8] and Bougle[9] should deter us from attempting reduction by taxis unless a definite diagnosis can be arrived at. In support of the view of Delore and Chalier (loc. cit), McAdam Eccles[10] thinks that many cases of "strangulation" are really inflammatory in origin—a view coinciding apparently with the majority of expressed opinions.

I have collected 58 cases from the literature, which, with the case just reported, makes up a total of 59; of these only 54 are available for analysis. Cases in which foreign bodies have been the exciting cause have been, with one exception, excluded from the list, because, unless the article is large enough to produce a typical acute attack (for example, a cherry stone), the majority present a mild clinical picture similar to the case published this time last year[11]; further, the real nature of many of these cases is often not established until the formation of an external faecal fistula[12].

Now, taking the series as a whole, the following appear to be the salient features serving to distinguish these cases more particularly from Richter's hernia and incarcerated omentum.

The extreme rarity of these lesions in children and infants is one of the striking features shown in the analytical table; for, with the exception of four infants under two years, no cases were found under 30 years of age. The onset is insidious, and the symptoms are progressively increasing in severity, unlike cases of strangulated omentum; indication of this is seen in the fact that the duration of the final illness was over five days in no less than *fifteen cases* (six weeks, twenty-one and fourteen days being the longest), and over three days in 28 instances. Again, a large proportion of these herniae have never been previously noticed; this is particularly applicable to the cases of strangulation, which, contrary to prevaling opinion, are exactly *twice as frequent* as inflammatory cases.

The size of the hernia progressively increases, often to a large size (especially in the inflammatory cases), it is either hard or fluctuating, tender, and invariably there is an absence of impulse and a dull note to percussion.

The skin over the hernia becomes red or oedematous at a comparatively early date, vomiting occurs in about half the cases and is rarely severe, while intestinal obstruction is infrequent.

B.

APPENDICITIS CASES.

	Cases.	Femoral.	Inguinal.	Tender.	Dull.	Fluctuation, Inflammation or Oedema of Skin.	No Impulse.	Vomiting.	No Faeces.	No Flatus.
Infants...	2	0	2	1	1	0	1	1	0	0
Children	0	0	0	—	—	—	—	—	—	—
Adults	9	5	4	7 (100 %)	4 (100 %)	3 (100 %)	1 (100 %)	4 (57 %)	1 (14 %)	1 (14 %)
Advanced Age ...	7	3	4	5 (100 %)	2 (100 %)	4 (100 %)	1 (100 %)	2 (40 %)	0	0
Male	9	1	8	6 (100 %)	4 (100 %)	4 (80 %)	3 (100 %)	2 (33 %)	0	0
Female...	8	6	2	6 (100 %)	2 (100 %)	4 (100 %)	0	4 (80 %)	1 (20 %)	1 (20 %)
Actual percentage where mentioned	18	8 (45.5 %)	10 (55.5 %)	13 (100 %)	7 (100 %)	7 (100 %)	3 (100 %)	7 (48.5 %)	1 (14 %)	1 (14 %)

STRANGULATION CASES.

	Cases.	Femoral.	Inguinal.	Tender.	Dull.	Fluctuation, Inflammation or Oedema of Skin.	No Impulse.	Vomiting.	No Faeces.	No Flatus.
Infants...	2	0	2	2	—	—	1	2	2	1
Children	—	—	—	—	—	—	—	—	—	—
Adults	24	18	6	18 (100 %)	2 (100 %)	4 (65 5 %)	2 (100 %)	11 (41.5 %)	9 (45 %)	[illegible] (36 %)
Advanced Age ...	10	9	1	9 (100 %)	1 (100 %)	6 (85.5 %)	2 (100 %)	5 (55 %)	4 (44 %)	3 (37.5 %)
Male	6	1	5	2 (100 %)	—	0	1	3 (75 %)	2 (50 %)	2 (50 %)
Female...	29	27	2	25 (100 %)	—	10 (83 %)	8 (100 %)	14 (50 %)	13 (52 %)	10 (40 %)
Actual percentage where mentioned	36	27 (75 %)	9 (27 %)	29 (100 %)	3 (100 %)	10 (76 %)	5 (100 %)	18 (48 %)	15 (44.5 %)	11 (51.5 %)

These statements, serving as a basis of differentiation, will be confirmed by a reference to the table.

Diagnosis will further be aided by an attempt to discriminate between inflammation and strangulation. The cases have been divided, for tabulation, into these two groups on pathological evidence at operation or autopsy (Table C), foremost amongst the indications being evidence of constriction of the appendix.

Table B gives the symptoms and physical signs, and A gives the history, sex, etc. The figures require a little amplification, but show, I think, that due allowance has been made for doubtful cases.

Table A, Turning to the table, it will be seen that adult life is naturally responsible for more than half the strangulation cases, 75 per cent. of which are in femoral herniae, and nearly all of these in females; the inflammatory cases, on the other hand, show an impartiality for both age, sex, and the situation of the hernia, in fact the inguinal herniae predominate (55 per cent). In the majority of inflammatory cases the previous existence of a hernia was noted, unlike the strangulation cases; while the gradual onset during rest in the former contrasts effectively with the fulminating nature of the attack during exertion or activity in the latter—facts which agree with the age incidence already referred to. Again, it will be seen that appendicitis was more frequent in adult females than males, which is in accordance with their sedentary lives and the resulting constipation; curiously, however, strangulation, is also five times more frequent in adult women than men. The conclusion arrived at, therefore, is that *strangulation is most likely to occur in femoral herniae* on anatomical grounds.

Turning now to the symptoms and physical signs (Table B), it is evident that an examination of the local signs, while affording evidence for the identification of these cases collectively, offer no means of differentiating them from one another.

Vomiting also occurred with equal frequency (48 per cent.) in both groups but intestinal obstruction accompanies strangulation far more often than appendicitis; for, whereas in the former there was retention of faeces in 41.5 per cent., and of flatus in 51.5 per cent., in the latter both these features show a frequency of only 14 per cent. These figures are independent of sex or age.

The appearance at operation or autopsy (Table C) sympathize closely with the details of narrative, symptoms, and physical signs, in their respective divisions of the table; they show moreover, that this grouping is supported by every kind of evidence. Thus oedema and friability of all the tissues, though only mentioned in three cases, occurred in 100 per cent. of appendicitis but is never referred to in strangulated appendices. Further evidence is apparent on a comparsion of the contents of the hernial sac; for, on the one hand, pus was present in 85 per cent., and, on the other, in 25 per cent. of cases, of which, it must be remembered, strangulation had been present in one for *fourteen days* and in two for *eight days*. Abundant lymph formation and adhesions, recent or of long standing (all signs of primary inflammation), were a prominent feature of appendicitis but *never* occurred in strangulation. Again, the nature of the hernia gives distinct assistance in the differential diagnosis; for of the

C. ANALYTICAL TABLE OF RECORDED CASES (*continued.*)

APPENDICITIS CASES.

	Cases.	Femoral.	Inguinal	Friability of Tissues.	Contents of Hernial Sac.				The Tumour		The Appendix.				
					Pus.	Lymph.	Turbid or Blood-stained Fluid.	Adhesions.	Small. Previous Size of Tumour.	Large. Size at Operation.	Evidence of Constriction.	Congestion.	Gangrene.	Perforation.	Evidence of Inflammation.
Infants	2	0	2	1	1	1	0	1	0 or –	+ = 1	0		0	1	2
Children	0	0	0	–	–	–	–	–	–	–	–	–	–	–	–
Adults	9	5	4	1 (100 %)	5 (71 %)	1 (25 %)	1 (33 %)	3 (60 %)	0 or –	+. = 4 (55 %)	0	0	3 (37 %)	6 (75 %)	8 (100 %)
Old age	7	3	4	1 (100 %)	6 (100 %)	0	0	3 (100 %)	0 or –	+ = 2 (50 %)	0	0	4 (57 %)	3 (43 %)	7 (100 %)
Male...	9	1	8	3 (100 %)	5 (62 %)	3 (37.5 %)	0	5 (100 %)	0 or –	+ = 3 (60 %)	0	0	4 (66 %)	5 (55 %)	9 (100 %)
Female	8	6	2	–	6 (85.5 %)	0	1 (14 %)	2 (100 %)	0 or –	+ = 4 (80 %)	0	0	3 (60 %)	4 (57 %)	7 (87.5 %)
Actual percentage where mentioned	18	8 (44.5%)	10 (55.5%)	3 (100 %)	12 (85.5 %)	2 (25 %)	1 (33 %)	7 (80 %)	7 (52.5 %)		0	0	7 (47 %)	9 (59 %)	17 (100 %)

STRANGULATION CASES.

	Cases.	Femoral.	Inguinal.	Friability of Tissues	Contents of Hernial Sac.				The Tumour.		The Appendix.				
					Pus.	Lymph.	Turbid or Blood-stained Fluid.	Adhesions.	Previous Size of Tumour.	Size at Operation	Evidence of Constriction.	Congestion.	Gangrene.	Perforation.	Evidence of Inflammation.
Infants . ..	2	0	2	–	1	0	1	–	0 or –	+ = 1	2	2	0	0	0
Children	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0
Adults	24	18	6	–	0	0	15 (88 %)	0	0 or –	+ = 6 (31 %)	18 (90 %)	12 (57 %)	10 (47 %)	1 (5 %)	7 (31 %)
Old age	10	9	7	–	4 (50 %)	0	2 (25 %)	0	0 or –	+ = 2 (22 %)	8 (100 %)	4 (44 %)	5 (55 %)	2 (22 %)	4 (44 %)
Male	6	1	5	–	0	0	2 (66.5 %)	0	0 or –	+ = 2 (33 %)	4 (100 %)	3 (60 %)	2 (40 %)	1 (20 %)	1 (7 days) (20 %)
Female	29	27	2	–	4 (17.5%) 1 = 14 days; 2 = 8 days	0	16 (69.5 %)	0	0 or –	+ = 5 (20 %)	25 (96 %)	13 (50 %)	13 (50 %)	1 (3.5 %)	6 (22 %) (All over 8 days except 1 case)
Actual percentage where mentioned	36	27 (75 %)	9 (27%)	–	5 (25 %)	0	18 (56.5 %)	0	9 (26.5 %)		28 (95 %)	18 (50.5%)	15 (51 %)	3 (13.5 %)	11 (37.5 %)

inflammatory cases, 52 per cent. show a rapid increase in size of the hernia from its original size or from zero. In appendicitis the hernia is nearly always of considerable size, while in strangulation it is usually small except in cases of long duration.

Finally, evidence of inflammation was found in 100 per cent. of appendicitis cases and in 37.5 per cent. of strangulated appendices, the high figure in the latter being explained by the long duration of many cases.

Gangrene occurred with equal frequency in both, but perforation rarely occurred in strangulation (13.5 per cent.), frequently (59 per cent.) in appendicitis; on the other hand, in the former evidence of constriction and congestion of the appendix occurred in 95 per cent. and 50.5 per cent. of cases respectively—pathological evidence which was never seen in appendicitis. On such statistics it cannot be doubted that the grouping is a correct one.

Conclusions.

1. Strangulation is twice as frequent as inflammation.

2. *Diagnosis* (collectively) rests on the symptoms and local signs.

3. *Differential diagnosis* rests on a combination of the following points:

(*a*) Age and sex.

(*b*) Situation of the hernia.

(*c*) Narrative, past and present.

(*d*) Local signs, particularly in regard to *rate of increase* and actual size of the hernia.

4. Even at operation appearances are deceptive, the appendix is sometimes difficult to identify, and accidents may occur unless this possibility is borne in mind.

Finally, death occurred in seven instances, and in every case resulted either from failure to realize in time the serious, though insidious, nature of the lesion or from attempts at reduction by taxis. These fatalities warn us against routine taxis, stimulate us to aim at a more detailed diagnosis of the contents of the sac in *irreducible* herniae, and call for earlier operation in doubtful cases.

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SYMPTOMS AND DIAGNOSIS OF ANTERIOR POLIOMYELITIS.*

BY

CHARLES M. NICE, M. D.

Pediatrician to St. Vincent's Hospital.

Birmingham, Alabama.

The progress and advancement of medical knowledge is liberally shown in the symptomatic and diagnostic study of this disease, anterior poliomyelitis. It is true that the laboratory has thus far outclassed the clinical side, yet a full consideration of the reports which have come from recent epidemics is extremely interesting, especially when studied with the classical text book as a correlary.

Numerous names have been suggested to better meet the demands of our present knowledge, just so with classifications which have been sought to correspond with the varied determination of symptoms. For the purpose of study, the writer would like to follow the general custom and suggest that the name *cerebro-spinal poliomyelitis* be substituted for the many now in use, believing that it more nearly meets the pathological and clinical aspects as they are presented to us.

As you know, the disease is most common in infancy and childhood though the elderly are not excepted. It occurs in the summer and fall months, the winter in some way appears to be a factor in dissipating the infection.

As a working classification, the disease may well be considered as appearing under three types; (*a*) mild, (*b*) severe and (*c*) abortive. Any or all of these may occur in the same epidemic or even, in the same household. In the *mild type*, the symptoms may be so slight as to escape unnoticed by the family or attendants and the true nature of the affection only discovered after disability or paralysis has occurred. Even the paralysis may affect only a muscle group or two, and the recovery so rapid that the afflicted one is able to walk or be around within a few days. The *severe type* may end in death within a short time after the onset. It is associated with suddeness, great pain, fever, prostration and perhaps with uncontrollable convulsions, dyspnoea and coma. The resulting paralysis may be of bulbar origin, giving pneumogastric distribution always to be considered with gravity, or there may be an extensive and irreparable paralysis leading to marked atrophies and deformities. The *abortive type* may display either of the above characteristics, but with an abrupt ending of recovery and without paralysis.

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*Read in Nashville, Tenn., before the Annual Meeting of the Southern Medical Association, November 8, 1910.

The symptoms may be further divided into *cerebral*, *spinal*, and *neuritic*, or there may be any combination of these irrespective of the type of disease. These terms are used to designate the characteristics of the preponderant symptoms in a given case. In the first instance, the onset is sudden, with severe headache, prostration, possibly delerium, convulsions, a retracted head and the presence of a Kernig's sign. In the second instance, the onset may be just as sudden but the symptoms are chiefly referable to the spine, as pain, a stiffened back and paralysis early of the motor type. The neuritic variety has great pain in the extremities with marked tenderness along the nerve trunks.

The disease passes through three stages as follows:

(1) *stage* of *onset*, (2) *stage* of *paralysis*, and (3) *stage of convalesence* and result.

The *onset* is preceded or accompanied with a few hours to a few days period of indisposition, restlessness and somnolence to which little attention is ordinarily paid. In eighty per cent of the cases there is a disturbance of the alimentry or respiratory systems such as constipation, diarrhea, angina or bronchitis. Following these, there is an abrupt onset of symptoms resembling in every way, an acute general infection. Vomiting, a chill, convulsions, headache, prostration, fever, sweating and great pain along the spine and into the extremities may ensue. The convulsions may be general or localized in distribution and may last from a few minutes to some hours. The headache is severely complained of and often associated with Nuchal rigidity. Tenderness is also noted along the spine and extremities, especially when pressure is made over the large nerve trunks. The fever ranges from 99.5°F. to 104°F. and the pulse is accelerated to 120 or 140.

In the severe form of this stage the patient appears to be much sicker than the symptoms may warrant. The child is listless, the face is flushed with dark circles beneath the eyes. It lies through preference in the mothers' or nurses' arms in an apathetic state, suddenly and frequently crying out with pain. Any attempt at passive motion is met with the same cry and sleep is constantly disturbed. Desire for food is not shown though frequent appeals for water are made. The sweating above mentioned is marked and of a clammy character, sudamina are common but herpes rare. Numerous other rashes have been described, none of which have been clearly observed by the writer. Anuria for a few hours is usually present at some time in this stage.

In older children, emphasis is laid on the headache and backache and intermittent pain in the extremities. Tingling and formication is also frequently spoken of. Upon examination, the throat shows a redness over the tonsils and up into the nasopharynx, but this is not characteristic. Hyperaesthesia is noted. The abdomen may or may not be retracted, and the abdominal reflexes are not disturbed. The patella reflexes are unequal, perhaps slightly exaggerated, later to become diminished, depending on the involvement of the cells constituting the reflex arc in the cornua. The blood picture is one of leucopenia, with a relative increase of lymphocytes. The spinal fluid is obtained with an increased pressure of 130 to 140, is clear, shows lymphocytes and is otherwise negative.

The above symptoms with the greatest varation of severity as has been mentioned, from a mildness which goes unnoticed to a severity which is extreme. The duration of this stage is from a few hours to three or four days ending either in death, in the second stage, paralysis, or in recovery without paralysis which constitutes the abortive type, now recognized. Very severe onsets are often times followed by mild results; again, a mild onset may be the fore-runner of the worst paralysis.

The *paralysis* is a sudden acquisition to the above symptoms and is noted any time within the first few hours or days of the disease. It reaches its greatest severity within a few hours and corresponds in location to the motor seats of the cord and encephalon. The former spastic condition of the muscles gives way to a flaccidity, the constitutional symptoms begin to abate but leaving pain of an intermittent character and tenderness over the nerves. The limb, which is most frequently affected, falls limp to the bed, has a lower temperature than its fellow, has a bluish discoloration and feels harsh and clammy. The reflexes are found to be unequal, diminished or abolished in the affected part. A partial Kernig's may be present at this time. There is no abnormality in sensation except perhaps in the gravest cases.

When bulbar affection is noted, the consequent paralysis may be a squint, ptosis, et cetera. but these are less commonly seen since the pneumogastric paralysis, an accompanying effect, practically always ends in death.

The lower extremities suffer from the paralysis in the majority of cases as is shown by the report of Duchenne and Seeligmuller (taken from Osler).

55 per cent. of cases, one leg was affected.
17 per cent of cases, one arm or both legs were affected.
5 per cent of cases, all four extremities were affected.
2 per cent of cases, both arms were affected.

In most cases only one lower extremity is involved, and when in combination with the upper, it is usually on opposite sides. The paralysis often affects the muscles in groups, the extensors of the leg, for instance, are more commonly involved than the flexors. Again, the muscles of the thigh and leg may be affected leaving the muscles of the foot uninvolved. The trunk muscles are rarely involved and in the cases reported, the curvatures are exaggerated and the abdominal muscles give a dome shape made prominent on coughing or crying.

The constitutional symptoms have now subsided leaving the patient in a weakened condition. The paralysis remains stationary and reactions of degeneration begin to appear. An increased faradic current is required to obtain a response until it gradually fails. The galvanic response is at first exaggerated until it too, gradually fails. Later improvement may be noted by a slow return of the faradic reaction. This state of affairs may remain stationary with some degree of atrophy, softness of the muscles, and a decrease in size of the same for from one to six weeks when it will suddenly merge into the stage of convalesence and result.

Convalesence is assumed by a spontaneous improvement in the paralyzed parts, noted first in the last muscle group affected and reaches its limit in from three months to a year. The electrical reactions become more normal, the skin becomes warmer and healthier in appearance and the limb becomes stronger and firmer, depending upon the quantity and quality of the improvement. Too often it is, that the permanent paralysis are extensive or remain in some very important group of muscles causing deformities that we are unable to cope with.

In the leg, the anterior tibial and peroneal group and in the arm, the deltoid are the muscles most frequently left with stains of the disease. Talipes valgus and varus associated with equinus, subluxations, shortening, fractures and disproportions of members are the final ear-marks to be feared and guarded against.

Diagnosis—With our present knowledge, it behooves one to give anterior poliomyelitis a critical consideration in any case of sudden onset, symptoms of general infection, and prostration accompanied with gastro-intestinal disturbance with pain and somnolence. Added to these, the autumn months, an epidemic, presence of fever, headache, backache and profuse perspiration with or without convulsions or delirium and the diagnosis should be arrived at before the unmistakable paralysis occurs. Spinal puncture should always be made as well as a leucocyte count, both being aids to the differential diagnosis.

When the cerebral symptoms are marked the diagnosis may be confused with *cerebro-spinal meningitis*, but the latter occurs more frequently in the winter months and the spinal fluid shows the presence of the diplococcus intracellularis. There is an equal and marked Kernig's sign and the absence of the characteristic paralysis.

Acute cerebral palsy may have a sudden onset with fever and convulsions. It is only after the paralysis, especially if diplegic, that the distinction can be made. In this, the paralysis is spastic, there is no atrophy or trophic changes, displayed by normal electrical reactions. The cerebral symptoms are present from the onset.

Multiple neuritis may be similar in the pain, atrophy, and electrical reactions, but the more gradual onset, sensory disturbances, previous history of diphtheria and finally, recovery, serve to make the distinction.

Acute transverse myelitis is characterized by anaesthesia, ankle clonus, involvement of the sphincters and absence of degenerative reactions.

Pseudo-paralysis of scurvy and *muscular weakness* of rickets are to be differeniated by the spongy gums and painful knees in the former; the signs of rickets, bilateral changes and absence of degeneration in the latter.

Hip joint disease and *localized traumatism* with fever are distinguished by previous history and electrical reactions.

Influenza, *typhoid*, *para-typhoid*, *rheumatism* and *auto-intoxication* are to be distinguished by their special symptoms common only to themselves and absence of nervous and atrophic muscular changes peculiar to anterior poliomyelitis.

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SHOULD EPIDEMIC POLIOMYELITIS BE QUARANTINED?*

BY

GEORGE P. SHIDLER, A. B., M. D.
York, Nebraska.

Primarily a disease should be quarantined whenever there is any liability of its being transmitted by the patient to other people providing the disease itself, sequalae or complications be of serious detriment to health or life: secondarily, if a disease be so suspiciously like some known quarantinable contagion or infection.

That poliomyelitis is detrimental to health and life no one will deny. That epidemic poliomyelitis can be transmitted by one patient to another must be proven to establish the universal quarantine of the disease. To this end I shall try to show first: that the histories of the greatest epidemics of infantile paralysis disclose the men reporting the same for the most part to have suspicioned, and many to have firmly believed that these epidemics were contagious or highly infectious. Secondly, I shall try to show that the history of our own Nebraska epidemic in so far as it was my misfortune to observe, proves conclusively that infantile paralysis is contagious, or highly Infectious, and therefore should be quarantined.

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*Read before the Nebraska State Medical Association.

In the past infantile paralysis has been roughly classified as to extent into sporadic and epidemic types. Sporasic cases were those occurring singly here and there with no apparent etiology or perhaps following some acute infectious disease which easily accounted for the cord degenerations.

Naturally the sporadic cases have not been quarantined unless secondarily along with the accompanying infectious or contagious disease. It has been this fact more than any other that has caused the medical profession to survey the epidemic variety of infantile paralysis with the same perspective, to watch with hopeless eyes and theraopeutics the spread of the epidemic into a pandemic, to hardly dare to believe the men who have stated that the epidemics were contagious, and to refrain from suggesting that the cases should be quarantined. Much time has been given to the study of the bacteriology and pathology when a share of this given to observation might have shown us that the greatest defensive weapon at our command has been rusting within our reach, I refer to quarantine.

In reviewing the literature for this paper we note that there have been about forty-seven epidemics of poliomyelitis reported. Bergenholtz first in 1881 reported an epidemic of thirteen cases occurring in northern Sweden. Cordier in June and July 1885 described the next epidemic of thirteen cases in a town of 1500 population. Oxholm described an epidemic of nine cases in Norway, July to September, 1886. Medin in an epidemic, 1887 reported 43 cases with three deaths occurring in Stockholm between May and September. It was noticed in this epidemic that several cases occurred in one house, a brother and a sister being affected together in one or two instances. Medin at the Tenth National Medical Congress in 1890 was the first to call particular attention to the epidemic occurrence of infantile paralysis. Putnam observed during the summer of 1893 an unusual increase in the number of cases occurring among the dispensary patients of Boston. Andre in Saint Girons, France, described nine cases in 1893. A brother and sister were first taken, then two children in a house very near to them, then two children in a house nearby to them, then other isolated cases. Caverly reported the first serious epidemic in this country occurring in Rutland, Vermont, between July and September, 1894. He recorded 126 cases with eighteen deaths. Most of these cases were in a narrow valley along a stream. Horses, dogs and chickens were also affected. Pieracinni observed a small epidemic in Monte Spertoli, a small Italian village on the mountain side. Bucilli saw a number of cases in the Ravicca quarter of Genoa in 1895, two occurred in one house, two others were brothers. During this epidemic it was noticed that several cases of cerebral palsy occurred at the same time, two of them in the same house with a case of spinal paralysis. He adds that a suburb of Genoa had an epidemic at about the same time. Medin observed an epidemic in Stockholm in the summer of 1895. There were 20 cases reported. Medin believed that there was a specific poison causing the infection and in several cases that it was probable that the direct contagion could be traced from one patient to another. Altman, in 1896 described an epidemic of 18 cases at Port Lincoln, South Australia, during March and April, the hot months in Australia. In two instances two members of the same family were affected. Pasteur at Much Hadam, England, in July, 1896, observed seven cases. Here he saw seven cases in one family living in the same house, all attacked within ten days. "It would seem probable," says he "that in the family some poisonous agent had infected all the children who responded in different manners to the infection." Taylor saw in July and August, 1896, seven cases in Cherryfield, Maine. This appeared to be infectious as the second patient was a brother of the first, the third a cousin of the first and second and the fourth was visiting in the house where the first three were affected.

Bounderant reported 15 cases occurring in Green County, Ala., during the summer of 1896, both whites and blacks were affected.

Buzzard described an epidemic in London, in 1897. In two instances the patients were sisters or a brother and sister.

Taylor, H. L., (New York), reported an increased number of cases in the Hospital for Ruptured and Crippled during July 1897.

Pleuss, recorded four cases in Keil in 1897. He thought these cases were sporadic cases.

Newmark, of San Franscisco described a small epidemic in the town of La Grand, Calif., a village of 49 people. Four children were affected. The first and second were brothers, the third a playmate of the first and second while the fourth was the son of the attending physician.

Packard recorded two cases at Royersford, Penn., in 1898, occurring within three days of each other in the same house.

Auerbach reported a small epidemic in Frankfort-on Main, between May and December, 1898.

Zappert described an epidemic occurring in Vienna, in 1898, of 208 cases. Infants under three attacked, and no cases were observed in which children in the same family were attacked. There was no relation to other infectious diseases.

Wickman observed 54 cases during an extensive epidemic in Stockholm in the summer of 1899. In three different houses two cases of the disease occurred, in several families two or three cases were observed among cousins or brothers and sisters. Wickman observed that the disease was not generally spread through the city, but was particularly localized in certain parts, so that in neighboring houses in the same neighborhood streets, groups of cases of three, five or seven were observed. In one instance there occurred a case in one dwelling house from which the family removed October 1st. A second case developed in this same house in the family that moved into the rooms not long after their entrance. He considered this a pretty good proof of contagiousness of the disease.

Leegard reported 54 cases in Bratsberg, Norway, in 1899.

Chapin reported an epidemic at Poughkeepsie, N. Y., during July and August, 1899. There were about thirty-five cases.

McKenzie described an epidemic of 17 cases in Washington and Amenia, N. Y., suburbs of Poughkeepsie, simultaneous with Chapin's epidemic.

Painter saw 52 cases between the months of June and September, 1900, in Glouster, Mass., 38 cases were under his own care. In a number of cases it appeared as if contagion was possible, two members of the same family being affected.

A. M. Woods witnessed an epidemic of 55 cases in San Francisco, during May and June, 1901.

Wickman observed 20 cases in Gotteberg, Sweden, in 1903. Three were sisters.

A. Lorenzelli reported 26 cases in Parma, Italy, in 1903.

Blackhall observed six cases at Queanbergen, New South Wales, during an extensive epidemic in December, 1903, Jan., Feb., 1904, the hot months there. Two of the patients were sisters, two were cousins, and one case occurred in the house next to the one in which sisters were affected. Various epidemics in different places at some distance from one another were recorded by different authors.

Litchfield reported 25 cases at Sydney, Australia during the summer months when there was an extensive epidemic of gastro-intestinal influenza.

R. B. Wade observed 34 cases at Stanmore near Syndey, in 1904. In several cases two or three members of the family were affected. Sometimes one member would develop paralysis and the other after several days of general malaise and undue fatigue would recover without paralysis.

B. B. Ham from October to December, 1904, saw a severe epidemic in Brisbane, Queensland. There were 108 cases. This was the third Australian epidemic.

Nannestad observed 41 cases of the disease in Hvalen, Norway, in the summer of 1904.

Platon witnessed in another part of Norway a smaller epidemic at Aafjorden, in the month of August. A number of these cases appeared to prove the contagiousness of the disease.

Geirsvold in Norway reported an epidemic of 437 cases during the summer of 1905. In a number of cases it appeared as if the disease were manifestly contagious and Geirsvold was able to trace the extent of the disease from house to house and village to village by contact. It is to be remarked that in a general discussion about the epidemic among the Norway physicians, opinions differed as to the contagiousness of the affection.

Wickman described 1031 cases occurring between the months of May and October, 1905, in the southern part of Sweden. These cases were distributed through a large number of small villages adjacent to one another and Wickman believes that the records which he has carefully investigated prove conclusively the contagious character of the infection. Many cases occurred in the same house, in many instances two or more members of the same family were affected. In one town it was evident that sixteen or eighteen cases originated from the same school house. In the majority of instances some contact could be traced between one patient and another and even the spread from one village to another could be accounted for by the passage of individuals from one town to the next town. The poison remained in the house so that new tenants were very often affected by the disease after old tenants had removed. In two cases an interval of one year's duration occurred in the same house.

Wickman reported a smaller epidemic in Sweden in 1906, only fifty cases being observed. These presented the same features as the other epidemic.

Lundgren observed an epidemic at Vardo, Norway, in the summer of 1905. He recorded 403 cases. This disease apparently was contagious as many cases were traced where the contagion seemed evident.

Terriberry first called attention to the extensive epidemic occurring in New York in the summer of 1907. He heard of a small epidemic at Ridgeway, Penn., which he visited to investigate. He found Ridgeway situated in a valley in the Alleghany Mountains about sixteen miles in length. Fifty cases developed here the first appearing at Elk Creek. A week later thirty cases appeared at Ridgeway, nine miles below. Seven days later eight cases developed at Portland Mills, nine miles below Ridgeway, and in every instance two or more members of the same family were attacked by the disease.

Griffin reported an epidemic in Oceana County, Mich., in the summer of 1907.

S. M. Free observed an epidemic of over 100 cases at DuBois, Penn., in the summer of 1907. Pigs and chickens were also affected.

Starr reported the New York-Brooklyn epidemic of 1907. It was estimated that about 2000 cases occurred. Other infectious diseases were not particularly prevalent. Nothing was recorded concerning the epidemiology. In 1908–9 there were epidemics in Minnesota and Wisconsin, in 1909 in Massachusetts, Minnesota, Colorado, Iowa, Wisconsin and northern Kansas.

This summer season passed has witnessed the spread of the epidemic from western Iowa where it closed last winter on across Iowa, into Illinois, across that state and into western Indiana. Three children died in one week at LaPorte if I am correctly informed. A few cases were reported at the very southern and western edges of Nebraska where the epidemic ceased last year. No new cases appeared in the area affected last year. But the epidemic seems to have continued its triumphant progress unchecked and growing stronger because it no longer limits its victims to children. On the other hand the tendency at the last of the Nebraska epidemic to attack older people has developed into a well-recognized feature of poliomyelitis. If we may volunteer an opinion we will dare to make the remark that Ohio will be the storm center next year.

Through the kindness of Dr. M. Allen Starr of Columbia University I am able to present this review of previous epidemics.

The Nebraska Epidemic of 1909.

More Especially in York County.

Beginning of Epidemic:—About July 4th, an epidemic of spinal disease of some sort was recognized in and about Stromsburg, Neb.

The malady seemed confined, in the main, to children under ten, many of whom showed unmistakably meningeal symptoms.

There was a consultation of physicians on several cases, and the diagnosis of acute poliomyelitis made in one case and cerebro-spinal meningitis in several others. According to most common text books and authorities, neither disease was quarantinable. There was a Fourth-of-July celebration with excursions from the surrounding towns and counties. By July 15 many cases began to be reported from the neighboring towns and country.

Dr. Anderson of Stromsburg who will next address you will speak more fully concerning its origin suffice it to say that house after house in some localities in Stromsburg contained infantile paralysis cases, yes, even some streets were a regular succession of cases. From Stromsburg the first great movement was to the west. A large crowd went to the Fourth-of-July celebration, and by the 15th of July one physician alone, Dr. Woeppel of Polk, had over a hundred cases. This may seem like an exaggeration, gentlemen, but I want to tell you that house after house down the country roads contained these cases and there were more often several than a single case in a home. The nearer Polk County the more cases. About Arborville the cases were more scattered. At Benedict there had been two cases following the Fourth-of-July celebration, but they had been promptly quarantined by Dr. Karrer and the local Board of Health. All children were ordered off the streets and sent home if seen down town unless on business. All families were cautioned to keep their children at home and suspicious cases were temporarily quarantined. Benedict, under strict adherence to these rules only had one other case all summer, although a few miles in any direction many cases existed. My confrere, Dr. O. M. Moore of York, was the first physician to make a diagnosis of Acute Poliomyelitis.

McCool sent her quota to the Fourth-of-July celebration. In addition the local Board of Health refused to act. None of the early cases were quarantined with the result that McCool had six or seven times as many cases as Benedict. The first case occurred in York after this manner. A mother had taken her small boy with her to Stromsburg to attend a wedding of a sister. At that time another sister was there in bed ill with the strange sickness. About five or six days after their return to York the little boy was taken sick, a physician called. The child had had a temperature for about four days. This fell by crisis leaving the little fellow with one partially paralyzed leg. The diagnosis was rheumatism and the little fellow allowed to mingle with all other children and neighbors. In the meantime the State Board had decided on Quarantine. This case was reported to the Board of Health by neighbors with children. The case was diagnosed as poliomyelitis and quarantined.

This was the first case in York. Next door there lived a family of six children. They began to have, one after another, slight fevers and developed similar symptoms. One had a partial paralysis of a leg, one of an arm and one of both legs; three had common symptoms, but no paralysis. A washerwoman brought her baby, allowing it to romp and play with these children while she worked. In five days it became ill, developed meningeal symptoms and died three days later with bulbar paralysis. Another child, a block east, contracted the disease, had paralysis of both legs and arms and, after two weeks of painless lingering, developed bulbar symptoms and died. At this time quarantine was established in York, and the malady checked. Later it was brought into the city again from outside, and again mastered by a strict quarantine.

Figure 1 shows diagrammatically the development of the disease near Benedict, Neb. At the house marked by a star there were three patients, one a nursing baby a year and three months old, one a girl of 12 years and a lad about 19 years old.

The baby recovered from a slight paralysis of the arm. The girl, who had paralysis of both legs and arms and could not turn in bed, has recovered the use of her arms, but has contractures of flexors of the legs which prevent her from standing or walking. The lad suffered only a slight indisposition for several days in the way of general aches, pains and stiffness of neck with a low temperature. He worked during this time. About fifteen rods from this house stands another farmhouse. A young fellow, a chum of the first, lives here. He developed the disease like the others with no visible paralysis. Both of the young men were on a threshing crew exchanging labor with seven other men ranging in age from 15 to 30. These men drank out of the same jug, worked hard in the hot sun together, ate at the same table and developed the disease, one after the other. One of the young men, aged 18, died. There were two 30 years of age infected.

The disease spread from Benedict to Marquette and elsewhere in the following manner:

A child came into Benedict from near Polk, Neb., and was taken ill; it returned to the country, where the case was diagnosed as epidemic spinal disease. The 12-year-old daughter of the family next had the malady at home. Several weeks later the son-in-law of the parents of the affected children came from Marquette, Neb., with his infant son and visited over night. In five days the infant came down with the disease, this being the first case in Marquette. A child of another family came in from the country to the house of the above mentioned family in Benedict about a month later, not having been allowed by its parents to see any other child all summer. She stayed one night at this house, returning home in the morning. In five days, that is, on the first day of school, she became ill, and after three days' fever developed a paraplegia of both legs.

In another instance, occurring in York, Neb., at place marked by a star (Fig. 2), a boy aged eight, developed what were diagnosed as typhoid symptoms—coated tongue, stair-step rise with higher evening temperatures and several days of prodromal malaise. The case was reported by neighbors and quarantined after child had developed paralysis of both legs. Before this, however, there had been a general exposure of the neighborhood. A child came to visit next door, at house marked 2, looked at some fish in front of the house with the sick child, next day went out in the country fourteen miles and in due time developed double leg paralysis after four days' temperature. The first child recovered after three weeks; the second child recovered the use of one leg after five weeks; the other leg developed atrophy with no electrical reaction and with a quadriceps femoris and tibialis anticus paralysis. The child hobbles about without aid of crutch or cane. On the other side, at house marked 3, 18-months-old boy had a fever for two days with partial paralysis of one leg and later complete recovery. Across the street, at 4, another infant, 16 months old, at the breast, developed paralysis of left leg. The parents attributed fever of one day's duration to teething. At 5 another infant became ill and after paralysis of several weeks developed a hypostatic pneumonia and died. These cases were all in a thickly settled Russian neighborhood. The children who were affected later had been with the first child when he had had his fever.

Three more cases occurred in York after this fashion. A child came into town perfectly well to all appearances, on a visit to his grandparents. About a week after his arrival he took "la grippe" as it was diagnosed. In three days his fever went down and he became unable to walk. While ill, he was on several occasions taken across the street to visit other children. Ten days later two of the three children here developed the same symptoms of a cold and fever. One of the two children had no paralysis, the other today has one atrophic flail leg. The original case has in the last three months recovered completely the use of his legs excepting after fatigue when he yet shows a marked weakness.

Again, north of McCool about two and a half miles a young fellow, 23 years of age who had returned from St. Paul, Minn., was attacked with spinal trouble. He has never regained the use of his legs to this day. His infection apparently came from McCool where he spent some of his leisure time. Near this, resides a neighbor who has a telephone. To this place the father of the young man came to use the telephone every day. About two weeks after the young man became paralyzed the five year old daughter of this neighbor with the telephone came down. In her case there was a marked paralysis of the scapular muscles on one side with a resulting noticable scoliosis. This disappeared after some four months.

Another instance; there were two daughters, sisters, aged eight and sixteen. The eight year old girl was mildly sick for a few days with only a resulting deltiod paralysis of one arm. Her older sister had a chum living about a half mile away. The older girl came down about a week after her younger sister, developing a double leg paralysis, later inter-costal paralysis and finally bulbar paralysis with death. This girl's chum had what seemed to be tonsilitis for several days but which was followed by paralysis of the tibial group of one leg.

Again, there was a family of three children all of whom had infantile paralysis. One child was an infant at breast, one a boy of five, the third a girl of ten. The baby had a deltoid paralysis for a few days, the boy a double tibialis anticus paralysis lasting for about four weeks, the girl had paralysis of arms and legs. She gradually regained use of her hands but cannot walk satisfactorily even today. The mother remembered having the children in the railway station at McCool where she was waiting some two hours for a train. At that time there had been a woman with a sick child on a pillow the only other occupant. The child was large enough to have walked. The mother of the three children was confident that this was the only chance her children had to get the disease as she had been from the very first so very careful that no other playmates came or that her little ones did not leave home.

There were no other cases in that immediate neighborhood.

And so I might relate series after series of cases to prove that this epidemic should be quarantined, that it is infectious and probably contagious. One physician reports fourteen cases in which the infection was traced in every case. One physician reports that his two children had the disease. One child recovered the other has yet a paralysis of one leg. I have emphasized this at length because there is nothing said about quarantine in the common text book, and it is the most important measure we have at our command to defend our children.

Number of Cases in Family.—Last summer when we were trying to teach the doctrine of quarantine we took sixty cases as they came and tabulated them in relation to the number of cases in a family because many would say that because there was only one case here or there when there were more children in the family to take it, the disease was not dangerous and did not need to be quarantined. The result in that sixty cases was so astounding that to give those who claimed there were so many places where more cases should be expected from a contagious disease, to give these people a show for their opinion, we voluntarily hunted out ten more cases where there was only a single case in a family of more than one child and added these ten to the already collected sixty. The result was this:

Thirty-one per cent. of cases occurred as single cases in families having more than one child. Forty-four per cent. occurred in families in which there were two or more children, all of whom acquired the disease. Four per cent. occurred in families where there was but the single child. Sixty-four per cent. of the cases occurred in families where there was more than a single child in the family affected.

On final analysis the cases in York County showed more to have occurred several in a family, twice over than singly in families of more than one child. More often every child member of the family was affected than one child out of many. And we might even expect that every child would not have the disease because infection depends upon not only the presence of the required toxin or organism but the organisms must be present in sufficient numbers, or the toxin in sufficient quantities, either must be virulent and fourth the patient's resistance must be lowered. It is indeed a great burden of proof to make any contagious disease carry if it depends on every child member of a family succumbing. What accepted contagious disease takes a greater per cent. than I have reported here? Can you think of any contagion more to be shunned? Is there any disease that can begin to leave the bitter traces that infantile paralysis has done? How many of our known contagious epidemic diseases spread with more certain rapidity than poliomyelitis?

In reviewing the different epidemics reported, with but one or two exceptions, the world over, all of the men who have mentioned epidemiology have expressed themselves as suspecting or of being positive that we had a contagious disease to deal with in infantile paralysis. One only marvels that they could avoid the logical conclusion of their claims, namely, that every case should be quarantined as soon as possible.

In York County we had about two hundred cases in town and country. York County was under the moral quarantine from July 15th. We were officially quarantined a day and a half or two days before Polk County. This quarantine was not always lived up to in either the country or towns, for several reasons, chief among which was the opposition to the Board of Health.

The first quarantine dictum of the State Board allowed the bread winners to go about their work providing they took some few precautions such as washing their faces and hands and changing their clothes. This only gave the public a false sense of safety. There is only one quarantine, "stay in or stay out."

So while the mortality rate increased during the declining days of the epidemic when the battle field had shifted into York County and while the age of those infected markedly increased over the early Polk County cases, the number of cases per given population decreased. The cause undoubtedly was due to quarantine. The gentlemen from Polk County will bear me out in this, I believe.

In the City of York we had about fifty cases in all. There were only four physicians conscientiously reporting their cases for quarantine at first. At this time however the Board of Health had the mothers with them. So that most of the cases were reported later and quarantined. After a time, during which the Board of Health had repeatedly asked that all cases be reported, one physician was arrested and fined for a flagrant refusal to report. The quarantine was made absolute by the local Board, every suspicious case was temporarily quarantined and inside of three weeks York was free from epidemic infantile paralysis.

In Stromsburg a strict quarantine began after we had started to quarantine in York. The same freedom had been obtained much earlier because of the team work of the physicians of that city.

It seems to us that epidemic infantile paralysis presents in the literature and in our own Nebraska epidemic unmistakable signs of transmission from one person to another. Surely we have ample proof of the results of quarantine. The complications and sequalae are undeniably horrible.

In conclusion I wish to quote from a paper of Dr. Anderson of Stromsburg in which he says under Mode of Infection:

"I believe that the majority acquired the disease directly from another ill or recently ill person, but a number of cases occurred which strongly indicate that the infection can be carried by a third person. Two families, A and B, living thirteen and fourteen miles northwest of Stromsburg had had no visitors nor had been away from home for some time except the sixteen year old daughter from family B, who visited at a family C two miles away, where a child was ill of poliomyelitis at the time. When this girl came home, the children from family A were visiting there. Five days later, a seven year old sister to the sixteen year old girl, who had not been away, became ill of poliomyelitis. A few days later a six year old daughter in family A became ill, paralysis setting in on the second day, gradually involving all the extremities and trunk, causing death from bulbar paralysis on the fourth day. On the following day, or five days after the fatal case became ill, another sister and brother became suddenly and violently ill, the latter also dying of bulbar paralysis on the fourth day. At intervals of a few days, three other children in family B. became ill, but all recovered completely in a few days, except two who had protracted recoveries. In at least one case, the infection was certainly carried by a thresher who had the sickness at his home, unbeknown to the neighbors, and a fourteen year old girl sickened about a week after the threshing. Extraordinary precautions had been taken against infection in this family for weeks previous to this indiscretion.

“In two families a peddler is suspected of having carried the infection. Hard work in the hot sun during the premonitory stage seemed to aggravate the symptoms considerably. As already stated this epidemic occurred during the hot months of the year, but equally hot weather persisted for weeks after the epidemic was well under control.

Number of cases ill in a family:

Single case in family of one child	1
Single case in family of two children	2
Single case in family of three children	7
Single case in family of four children	3
Single case in family of seven children	1
Two cases in family of two children	7
Two cases in family of three children	5
Two cases in family of four children	1
Two cases in family of five children	2
Two cases in family of six children	1
Two cases in family of eight children	1
Three cases in family of three children	1
Three cases in family of four children	2
Three cases in family of five children	2
Three cases in family of six children	1

Three cases in family of seven children.	1
Four cases in family of four children.	1
Five children in family of six children.	1
Six cases in family of ten children.	1

"In forty-one families of 150 children, eighty-six or 57 per cent. contracted the infection. Isolation of the sick was carried out as far as possible, and where many were sick in one family infection had usually occurred before medical aid was called."

Also from a report of fifty cases of poliomyelitis by Dr. J. C. Malster of Stromsburg, Nebraska in which he says:

"Nearly every case could be traced to some other case or to a locality where the children played together. Quarantine checked it and caused fewer in the family to have the disease; and isolation, together with care in not allowing kissing of the sick, eating and drinking after the sick, etc., also helped to check it."

109 1-2 East 6th St., York, Nebraska.

HUMAN MILK AND BREAST FEEDING.*

By

Dr. OLIVE M. ELGOOD, M. S., Lond.

Birmingham, Eng.

The work, certain results of which I propose to figure before you on the lantern, was commenced with a view of making periodic examinations of as large as possible a number of samples of *human breast milk* with regard to their content in (1) fat, (2) solids not fat, including protein, carbohydrate, salts taken collectively; and, further, if possible, to watch coincident conditions of the infant and mother relative to the variations found in the milk.

The work was started at the request of Dr. Robertson, Medical Officer of Health for Birmingham, who has taken such an eminent part in the recent combative study of infant mortality; and the facilities for working in the laboratories of the Birmingham University, the services of one of his health visitors, and the necessary apparatus for the carrying out of the work were all supplied by him. The actual procedure and technique of the work have been as follows:

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*Read before the Seventy-eighth Annual Meeting of the British Medical Association held in London, July 26th to 29th, 1910, Publshed simultaneously in the *British Medical Journal*.

Mothers registered as recently confined were visited about fourteen days after confinement, and the time taken in each case by the infant to empty the breast was noted.

At subsequent appointed times the mothers were directed to leave one breast untouched for four hours, before the time appointed for the health visitor's visit. She then had the baby put to the breast for half the time already noted, and then drew 10 c.cm. by digital expression. Thus this sample was supposed to represent the middle milk of the total breast content, and should, consequently, present an average composition for the whole.

In later cases this procedure was slightly altered, in that the whole breast was emptied by an exhauster, thoroughly shaken up, measured, and a sample taken.

The technique of examining each sample was as follows:

For Fat.—Ten c.cm. of sulphuric acid of specific gravity 1080 are put into an acido-butyrometer, such as the one before you (specimen shown). Five c.cm. of the sample of milk under examination are then drawn into a pipette and made up to 11 c.cm. with distilled water and this added to the acid; and, lastly, 1 c. cm. of amyl alcohol. The whole is then thoroughly shaken till all traces of casein deposit has vanished, and placed in the compartment of a Gaertner and Hugershoff's milk tester, two or four tubes being necessary to keep the balance. This apparatus is a powerful centrifuge worked by means of a catgut. Three revolutions are performed as a routine practice, and the tubes are then removed to a hot-water bath, and the layer of fat that has risen to the surface is read off by the graduations on the neck. A spirit lamp may be kept under the centrifuge to keep up the heat already generated by the action of the acid in the tubes.

For the Solids not Fat—The rest of the sample may be poured into a small polished metal dish of known weight and weighed. The dishes containing weighed quantities of milk are then placed in a hot-water oven. After about ten hours the dishes are weighed again from time to time, and when successive weighings show no further decrease, this weight indicates that drying is complete. From the total weight of dry solids the percentage is obtained, and by deducting the already determined fat percentage that of the solids not fat is obtained.

The first series figures the results of the periodic examinations of the maternal milk in four cases. These four cases were chosen at random, and neither mother nor infant was specially healthy nor otherwise—just the usual kind seen in the city slums.

SERIES I.

CASE A (*Fifth Child in Family*).

Period of Lactation:	2nd Month.		3rd Month.		4th Month.
Percentage of fat	1.9	3.1	4.6	4.0	5.9
Percentage of solids not fat	8.0	8 5	8.5	8.7	9.0

Average: Fat, 3.1 per cent.; solids not fat, 8.54 per cent.
The infant was weaned at the fifth month.

CASE B (*First Child in Family*).

Period of Lactation:	2nd Month		3rd Month.		4th Month.	5th Month.	7th Month.	8th Month.
Percentage of fat ...	3.5	5.6	4.0	2.4	2.9	4.7	7.0	3.5
Percentage of solids not fat	8.5	8.7	8.0	10 0 (?)	8 5	8.3	9.4	

Average: Fat, 4.2 per cent.; solids not fat, 8.7 per cent.

CASE C (*Fifth Child in Family*).

Period of Lactation:	1st Month.		2nd Month.	3rd Month,	Average.
Percentage of fat	4 7	6 6	5 9	6.3	5 7
Percentage of solids not fat	9 1	9 3	9.0	10.0	9.35

Mother went out to work after the third month.

CASE D (*Seventh Child in Family*).

Period of Lactation:	1st Month.		2nd Month.	3rd Month.		4th Month.	7th Month.	8th Month.
Percentage of fat ...	5 9	3.2	3.9	3 2	5.1	5.5	6 3	3.5
Percentage of solids not fat	8.5	8.4	—	8 3	8.7	8 5	—	8.4

Average: Fat, 4 6 per cent.; solids not fat. 8.45 per cent.

Average on the four cases: Fat, 4.4 per cent.; solids not fat, 8.75 per cent.

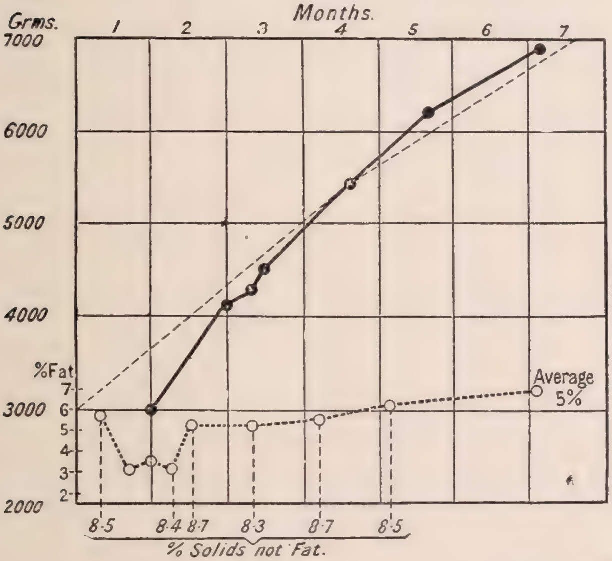
On examination of these figures I venture to deduce three points:

1. Very considerable variation in percentage of fat exist in the same and in different cases at the same period of lactation. Therefore, the average fat composition quoted in nearly all text books has probably very slight value.

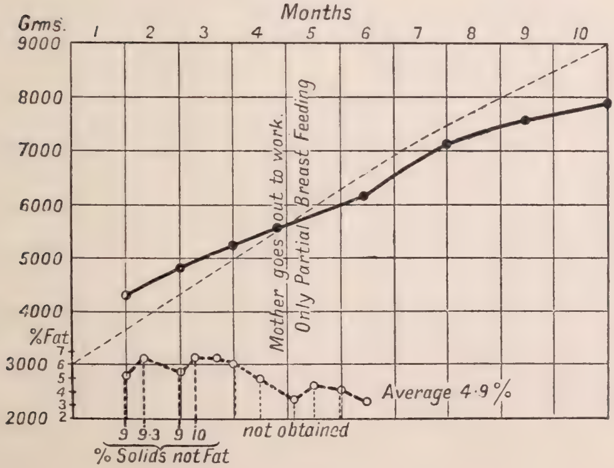
2. On the other hand, a marked constancy in the solids not fat exists in the same case, and though variable in different cases, not to nearly the same extent as the variation of fat.

3. The variations of fat do not depend upon the period

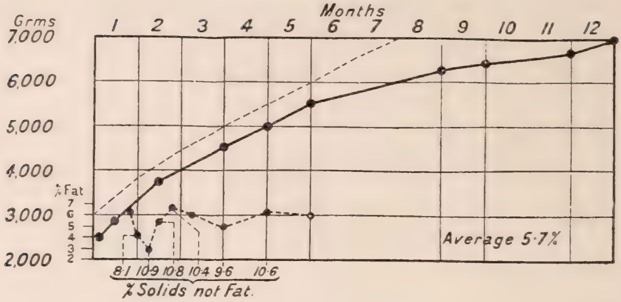
SERIES II, CHART I.



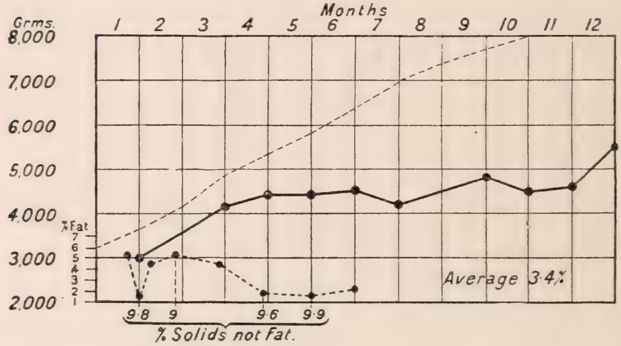
SERIES II, CHART II.



SERIES II. CHART III



SERIES II. CHART IV.



of lactation—that is, the fat does not increase in quantity necessarily as lactation proceeds; neither do the solids not fat. Therefore, the old method of gradually increasing the strength of cow's milk in hand fed infants is subject to criticism.

The second set of observations which I offer in this paper arises from the four following charts, Series II of my cases.

The charts shown in this series all indicate respectively:

1. The weight curve in grams of different infants, compared in each case with the normal standard curve as estimated by Budin during the lactation months.

2. The percentages of fat and of solids not fat in samples of the natural milk, on which the infant was nourished, collected periodically.

The *fat* is shown in dotted curves corresponding to percentage figures on the left hand side of the chart; the *solids not fat* shown in percentage figures along the bottom of the chart, corresponding to the dotted ordinates.

Each black upright line represents one month of lactation; therefore the periods at which the examinations have been made are clear in each case.

Note in charts I and II how slight are the variations in the milk while the weight of the infant is normal. In the latter part of chart II and in the following two charts, III and IV, while the rate of increase of weight is below the normal healthy rate, the content of fat and solids not fat both show greater fluctuations.

Of these, the most obvious facts patent in chart I are the constancy of fat composition of the milk and the high level of the infant weight curve; and one may suggest the deduction that the healthy rate of infant growth is dependent to some extent on the constancy of fat composition of the breast milk.

This is again borne out in the first half of the second chart (series II, chart II); but note that at the end of the fifth month, poverty overcame the family, the mother went out to work and some of the breast feeding was discontinued. The fat percentage now falls to a lower level, *becomes subject to fluctuation*, and the rate of infant growth coincidentally falls.

The last of this series (charts III and IV, series II), show this again, that is, that variable fat composition determines a low level of infant growth.

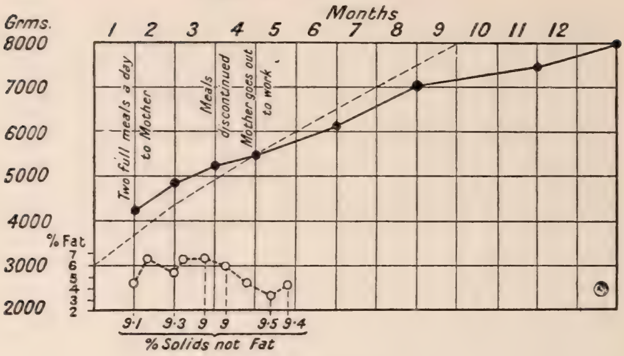
With regard to the importance of the solids not fat, these may be seen to fluctuate in chart III, but in all the other three cases they are very constant, irrespective of the rate of infant growth.

It is not, therefore, possible to generalize on the importance of the solids not fat thus far.

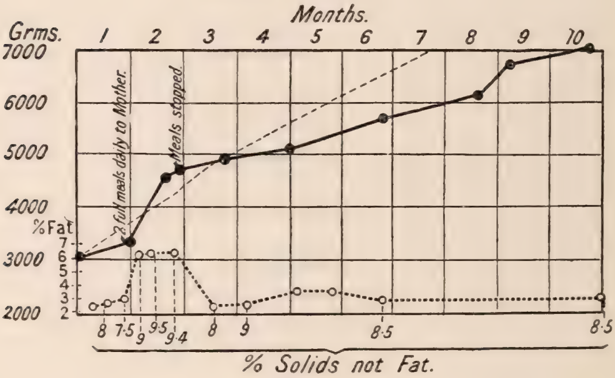
In the third series I put before you three successive charts, each representing infant weight and milk compositions in the same way, but in each the mother was given for a stated period two full meals a day. In each case the effect is seen on: (*a*) the weight curve of the infant; (*b*) the quality of the breast milk with regard to the fat percentage.

It is very interesting to notice that the solids not fat are not quantitatively affected by giving the mother regular meals, this suggesting that the fat is the more important constituent for the infant's welfare.

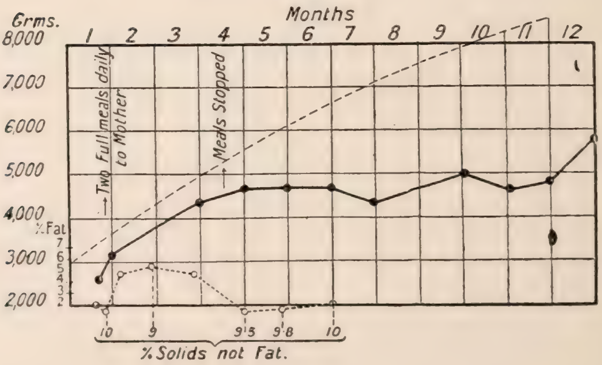
The last series shows some figures illustrating the ratio of fat content to total quantity of milk at any time in the breast, Series III, Chart I.



Series III, Chart II.



Series III, Chart III.



and is also interesting as showing how much a breast contains at different periods of lactation.

Engel, who seems to have done the most complete work on human breast milk that I can find recorded, states that the percentage of fat is entirely dependent on the total quantity, that is, a high average percentage means a concentrated milk, a low average percentage means a dilute milk, and that the ratio is mathematically exact. My figures do not agree with this. That there is a certain inverse relation is apparent; thus in case I, series IV, with 86 c.cm. drawn off, there is 1.8 per cent. fat, with 43 c.cm. 3.8 per cent., but again with 57 c.cm. 3 per cent.; but that it is a definite secretion determined in quantity by variations in tissue metabolism, and is not a mere concentration in the fluid milk is, I think, clear. With regard to quantity obtained, this apparently varies very largely, the variation being not dependent on either (1) *time of day* (this being given in each case) or (2) *period of lactation.*

I found on inquiry that it did depend largely on the feeding and especially the amount of milk the mother had. To see, if possible, whether the amount removed by the exhauster represented actually the amount removed by the infant suckling, I obtained some figures from the Birmingham Maternity Hospital where, up till the twelfth day, when the mother and infant are discharged, it is the routine practice to weigh each baby before and after every meal, so as to get the exact amount of milk obtained by the infant.

This I found increased progressively from the first to the fifth day from two to ten grams on the first, to from 50 to 70 on the fifth, and then remained about the same till the tenth or twelfth day. These figures may all be slightly reduced for speaking in c.cm., so that we may say from 45 to 70 c.cm. is an average quantity for an infant to obtain during the first fortnight.

None of my own observations were taken until after the first fortnight, but in each case one observation was taken within the second fortnight, and since in three of them the figures are well above 70 c.cm. it is probable that the breast exhaustor can actually extract as much as the infant is able to withdraw by suckling.

To sum up briefly, it may be said that the chief points elucidated by these practical examinations are the following:

SERIES IV.

Tables showing Time of Day when Breast Emptied and Specimen of Milk was taken.

CASE I.

	1st Month.		2nd Month	3rd Month	6th Month.	
	12.45 p.m.	11.30 a.m.	11 a.m.	11.30 a.m.	11.45 a.m.	
Total quantity in c.cm. expressed	86	43	57	57	43	50
Percentage of fat content	1.8	3.8	3.0	4.7	6.0	4.6

CASE II.

	1st Month	2nd Month.	3rd Month	6th Month	7th Month.
	12.30 p.m.	11.30 a.m.	11.15 a.m.	11.30 a.m.	11.30 a.m.
Total quantity in c.cm. expressed	86	114	43	72	43
Percentage of fat content ...	4.6	3.8	5.0	2.9	6.4

CASE III.

	1st Month.		2nd Month.		
	11.30 a.m.	2.30 p.m.	12.15 p.m.	11.45 a.m.	11.45 a.m.
Total quantity in c.cm. expressed	140	114	114	86	140
Percentage of fat content ...	2.0	3.5	2.5	3.0	2.0

CASE IV.

	1st Month.		2nd Month.	
	12.30 p.m.	2 p.m.	12.30 p.m.	12.30 p.m.
Total quantity in c.cm. expressed	43	43	57	43
Percentage of fat content ...	3.0	2.0	2.3	2.8

Note also, from above, that the time of day does not necessarily affect the quantity of milk in the breast; for example, Case III, at the same time, under the same conditions, on days both included in the same month of lactation, 86 c.cm. are drawn in one day, 140 c.cm. on another.

1. The constituent of human milk most important to the healthy growth of the child is the fat.

2. To maintain the healthy growth the percentage of fat content in the milk must be kept at a constant level and not be allowed to fluctuate. Therefore in treating any given case the examination must be made frequently to ensure that this constancy is present.

3. To maintain both the necessary constancy of fat percentage, and a good quantity of milk in the breast, the nursing mother must be fed with regular meals.

4. Lastly—a point of physiological interest—that the variations of fat are not dependent upon increasing concentrations of the milk as lactation proceeds, but are actual variations in the secretion dependent upon some accidental and temporary variation in the physical condition of the mother.

SOME POINTS IN THE MANAGEMENT OF BREAST FEEDING.*

BY

THOMAS B. COOLEY, M. D., Lond.

Detroit, Mich.

I think I scarcely need say here that successful breast feeding is not so common as all of us should like to see it; nor need I say that, no matter what progress the pediatrists have made and may still make in the science of artificial feeding, the bottle is not, and never will be, a perfectly satisfactory substitute for the breast.

A great deal of attention has been given to this subject during the past few years by pediatrists and by sanitarians. The pediatrists have determined to their own satisfaction that a far greater percentage of the babies could be successfully nursed, at least during the critical first months, than are so fed at present. In fact, it is believed that at least ninety per cent. of all mothers are capable, under proper supervision, of nursing their babies during this period.

The sanitarians, realizing that the mortality among infants is still high, in spite of improvements in producing, handling, and feeding cow's milk, have taken up the subject with a good

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*Read at the Forty-fifth Annual Meeting of the Michigan State Medical Society at Bay City, September 28-29, 1910, Published simultaneously in *Michigan State Journal of Medicine*.

deal of energy, and there is at present wide-spread movement on the part of public health authorities to educate the public, and especially the poor, to the possibility and desirability of more general breast feeding.

So far, however, the general practitioner, to whom falls the management of a very large proportion of the babies, has not participated especially in this movement; and I think I may say safely, and I hope without offence, that the average practitioner gives very little study or thought to this really important subject, and consequently, when confronted with any but the most simple and straightforward case, is only too ready, at the first sign of trouble, to give it up and prescribe some proprietary food.

It is a common experience of pediatrists, inquiring into the history of difficult feeding cases, to find that the child was ordered weaned by the attending physician some time during the first few months, because of colic, temporary failure to gain, or perhaps merely because the mother thought her milk was giving out, or was afraid it was not good for the baby, without any really intelligent attempt having first been made to adjust the difficulty. Sometimes, even, the child is given the bottle from birth, with no attempt at nursing, perhaps because a former child did not thrive on the breast, or for any one of a number of equally valid reasons.

Now if breast feeding is to be as common as it should be, it is the general practitioner who must accomplish it, and he ought, I think, to give the subject more attention, and to be better prepared to meet the more common difficulties.

My idea in preparing this paper has been not to write a treatise covering the whole subject of breast feeding, but to speak briefly of the more common difficulties and how to handle them.

Contraindications to Nursing.—Under this head I wish to say that one hears some curious things. I have seen a baby put on the bottle at birth by a physician of considerable local standing, because (he said) the mother was nervous, and therefore would give milk which would be bad for the child. It is not at all uncommon for a second child to be put on the bottle because nursing, for some resaon or another, was a failure with the first.

There are, in general, two contraindications to nursing. First, definite risk of transmitting a serious infection from mother to child, or vice versa; second, illness or weakness of the mother so marked that nursing would be a dangerous drain upon her. If neither of these exists, nursing should be attempted. In regard to the second, it is too often assumed with regard to the mothers who are perhaps only temporarily exhausted, and who, with care, might bear the nursing all right.

Another contraindication is, of course, total absence of milk. This, however, is rare, and should not be assumed too soon. If milk does not appear for several days, it is better, with a healthy child, to wait, giving only boiled water with a little milk sugar, rather than give an artificial food so early.

Hygiene and Diet of the Nursing Mother.—This is a field calling for the exercise of common sense more than science. The mother should lead a life which fits her to produce good milk. Obvious as this may seem, it is a point often given little attention. Normal exercise, not household drudgery, nor physical exhaustion, is important, and still more important is the avoidance of mental excitement or worry. I sometimes think that among the better classes the tendency nowadays is to prolong the period of rest after confinement too much, and that it would be better for the child and just as well for the mother if she resumed her normal life, avoiding of course, anything like hard work somewhat sooner. As for diet, it also should be normal and simple with such additions when necessary as may tend to increase the milk supply. There are some common and rather foolish superstitions concerning what the nursing woman may eat. For instance, it is usual to find acids and fruits forbidden because of a supposed effect upon the milk. There are a very few foods containing substances which are excreted in the milk, such as the volatile oils of the garlic family. Aside from these, foods affect the milk injuriously only as they disturb the mother's digestion, and I believe it to be better that the mother should be allowed to eat, within reason, what she likes, provided the diet be well balanced and her digestion good, rather than to risk disturbing her nutrition, as is often done, by eliminating things to which she is accustomed, and which are a stimulus to appetite. In other words, the diet should be agreeable to her. As to the use of gruels, cocoa, and the other things given to promote milk formation, they should be given not so much as a routine as when they are needed. When they are used, it should be borne in mind that if they are pushed to the point of being disagreeable, their effect is likely to be lost, and the mother's digestion may be upset. This is especially true of milk, which many women do not take well in quantity. As to the choice of these articles, it is not of so great importance. The point is to get a well-balanced food, with plenty of fluid at the same time, and it is because of these qualities rather than because it is milk, that milk is of value. Of gruels, that made from corn meal is probably the best. Cocoa made with milk has the advantage of being often better taken than plain milk. The malt drinks are often objected to as producing milk of poor quality. Inasmuch, however, as the milk, when insufficient in quantity, is very likely to be somewhat over rich, these preparations meet the indications in many cases very nicely, provided always that they are agreeable to the mother, and do not disturb her digestion.

The Feeding Interval.—Nothing in my opinion, has more to do with the various disturbances in the course of breast feeding than too frequent nursing. The current practice seems still to be to feed the child every two hours during the first six weeks, then every two and one-half hours, and so on. Just how this practice originated I do not know, but I am convinced that it is pernicious, and am glad to say that the number of specailists who have adopted a longer interval is constantly growing. The child who is fed every two hours has almost never, during the day at least, an empty stomach. The stomach gets no normal rest, and a mild gastritis not uncommonly follows. This is especially likely if the milk is somewhat over rich, fat being always slow to leave the stomach, so that often portions remain from one feeding to the next. Spitting, colic, the false hunger resulting from an irritated stomach, and sometimes more serious conditions, are likely to result. Not all of us follow Czerny and Keller in recommending a four-hour interval from the start, but I think that a large proportion of the more progressive men are now urging that the feeding be never less than three hours apart, and about four hours after the first few weeks.

Another point in regard to the feeding interval. One meets many physicians and more nurses who insist on absolute regularity in the interval. On the stroke of the clock the child is to be put to the breast, hungry or not hungry, sleeping or waking. Now doubtless a reasonable regularity works for the convenience and comfort of the mother, but I cannot believe that the child will digest so well if urged to eat before he is hungry or when wakened from a sound sleep to feed. Certainly I feel that I get better results from my own method. I usually order, during the first two or three weeks, that the child be nursed not oftner than every three hours, nor more than seven times in twenty-four hours. After this period about every four hours, and not more than six (better five) times in twenty-four hours. With these restrictions he is to be fed when he is hungry. I make an exception of the last evening feeding. If the child is asleep at the mother's bedtime, it is usually best to waken him. I adopted this system very tentatively, feeling not at all sure how it would work, but have found it invariably easy to manage, with much more comfort for both mother and child. Babies fed in this way almost always sleep better, cry less, and need less attention.

Colic.—Of all the disturbances incident to breast feeding, none is more common nor more annoying than colic. In fact, many people seem to regard it as a matter of course—inevitable and irremediable. It is more frequent during the early weeks, is likely to be accompanied by stools containing soft white curds, and is, I think, almost always the result of fat indigestion, of which the white curds are an indication. Many women, and especially young mothers, secrete during early lactation, and particularly in the time when they are still in bed or not getting a normal amount of exercise, a milk somewhat over rich in fat, and some, especially if their diet is injudicious, continue to do so for months. Fat fermentation, and colic, are quite natural results of this condition; but it is remarkable how much less one sees of them with the longer feeding interval. The lengthened interval is not, however, always sufficient to do away with the colic, and then it may be necessary to attempt to make the milk less rich, by diet, the taking of fluids, exercise, etc. Sometimes, in addition, one may dilute the milk in the baby's stomach by giving a little boiled water or soda water before the nursing. An occasional clearing out of the fermenting matter with castor oil is of considerable value. It must be said, however, that there are babies who continue to be colicky in spite of all one can do for them. If they do well otherwise, it is not wise to wean them for this alone. Colic seems also not infrequently to be caused by too much milk, and in this case cutting short the nursing is usually all that is needed.

Variation in Quantity and in Quality of Milk.—These are common, depending upon the mother's diet, her physical condition, nervous state, the appearance of menstruation, etc Variation in quantity may be detected by a method which ought to be more commonly used than is, viz.: weighing the child before and after feeding, the difference in weighings showing the quantity obtained. The information obtained in this way is very valuable, and almost indispensable, when the question arises whether the supply is sufficient for full breast feeding, or whether mixed feeding or weaning is necessary. It is common for the mother to think from the child's behavior that the supply is insufficient, when the fact is that he is getting too much. Variations in quality may of course be detected by analysis of the milk, and for this purpose the fat determination is usually sufficient. Analysis, however, is not always necessary, and is often misleading. It is well known that different infants thrive on milks varying widely in fat content, and in most cases the child's behavior and the character of the stools are as good a guide as an analysis, or better. If the milk is too rich for the individual child, he is likely to be colicky, to spit up fat curds some time after nursing, and to have stools which smell sour and look greasy, or contain soft white fat curds, often with mucus. A milk which is distinctly deficient in fat looks watery to the eye, and the child, while usually manifesting no especial digestive disturbances, does not gain in weight and is hungry.

Variations in the quantity of milk can often be corrected by giving the mother more or less fluid, regulating her exercise, and so far as possible preventing nervous disturbances. There is a good deal of doubt as to the effect of drugs in increasing milk secretion. I am inclined to believe that thyroid at times does have some effect. It is to be carefully watched.

Over rich milk may usually be to a considerable extent corrected by more exercise, more fluids, and less proteids and fats in the diet. If the milk is only slightly poor, an attempt may be made to increase the fat content by the reverse of this regime. When the milk is distinctly low in fat it is almost invariably an indication for weaning.

It is quite possible to do too much in the way of weighing, milk analysis, and changes of diet. I have seen more than one mother, perhaps already over anxious about her ability to nurse the baby, so worried over slight abnormalities in the stools, analysis of the milk, attempts to correct trival variations, as to lose her milk altogether. If the baby is doing fairly well, it is best not to fuss too much.

Abnormalities of the Stool.—Some of the most important of these have been mentioned. Moderate frequency, fat curds, lack of smoothness and homogeneity, and even small amounts of mucus, are less important in breast feeding than in bottle feeding, and usually one need not pay much attention to them unless as an indication of the cause when there is definite digestive disturbances. If mucus, frothy stools, or gas, are common, an occasional dose of oil (not calomel), to remove fermenting material, may head off trouble. Fermentative disturbance and bowel infection occur in breast as well as in bottle feeding, and may necessitate temporary withdrawal of food, in which case care must be taken to empty the breasts regularly in order that the supply may be preserved.

Mixed Feeding —Sooner or later, the time will come with most women when the supply of milk is insufficient, and at this time mixed feeding, from breast and bottle, is usually resorted to. The common way is to replace one or more breast feedings by bottles. When this is done, the stimulus to the mammary gland offered by regular nursing is partly withdrawn, and as a result the supply diminishes more rapidly still, and soon another and another bottle feeding must be added, until in a short time the child is weaned. From the sixth month on this may be all right, but at three or four months it is not to be desired. It certainly seems more sensible, and has worked much better in my experience, to supplement each nursing by a small bottle feeding, rather than to discontinue any of the nursings. Moreover, as the breast milk when it diminishes in quantity is often over rich, this fault can be corrected if it is mixed in the stomach with rather dilute cow's milk. Mixed feeding managed in this way can often be successfully carried over a period of months.

Weaning —If breast feeding, or mixed feeding, has gone satisfactorily, the time of preference for weaning is at nine or ten months, and it is easily managed through mixed feeding by shortening the time at the breast and giving more from the bottle until the feeding is all artificial. In this way one has a chance to bring the child easily to a proper milk modification, and soon to whole milk. Earlier weaning may be indicated by persistent failure to gain in weight on the breast or mixed feeding, or by digestive disturbance of importance which cannot be remedied by any changes in diet, nursing interval, etc. Sudden weaning may at any time be necessitated by illness of the mother, or complete cessation of lactation. It is important here to begin the artificial feeding with a more dilute mixture than a child of the same age and weight would take if already accustomed to cow's milk.

Unnecessary weaning, because of slight digestive disturbances, colic, green stools, etc., is altogether too common. One hears that the doctor told the mother her milk was "poisoning the baby," when really a little patience would have brought things out all right. It is always to be remembered that it is a great handicap to a baby to be put on artificial food during the first three or four months, and that the conditions leading one to do this should be really serious.

Conclusion.—In conclusion, I want to say that what tendency there is to a change in methods of managing breast feeding is not the result of following out anybody's preconceived theories.

It appears to me that there is here something of a "back to nature" movement,—an inclination to follow, so far as possible in an artificial civilization, the methods of the animal and the aborigine; and surely it is reasonable that such a normal, physiological process should be led as much as may be in the normal natural way.

SOCIETY TRANSACTIONS

Section Diseases of Children, Michigan State Medical Society.

DISCUSSION ON DR. COOLEY'S PAPER

Colic.—Dr. H. McLaren Gale, Bay City, Mich.—I feel that I ought to rise to endorse the writer's paper. I think it an excellent one, and corresponds to my idea of handling the feeding of children.

First of all, he emphasized the regular and liberal feeding of the mother with plain food, and then insisted on three to four hour feeding in place of two hours, which is unnatural and cannot but be injurious. In my experience those two things are particularly worth paying attention to, not forgetting the importance of one long interval between feeding during the night of six or eight hours. For colic in children you will find that care in the diet is the main thing, as the cause of colic is mainly too frequent feeding. By understanding the time required between feedings, you will do a great deal in checking any trouble. So far as my experience goes, I think the whole paper was an excellent one.

Wet Nursing.—Dr. Herbert M. Rich, Detroit.—I would like to emphasize the importance of this paper. It seems to me that so far as the practice with children is concerned there is no more important subject to be considered! Too often it is taken for granted that nature's method will handle the case, when, as a matter of fact, very slight directions and little attentions on the part of the doctor will often go a great way in enabling the nursing to be carried on successfully. I am sure we will all agree with Dr. Cooley's directions in that respect.

There is one point upon which I am also sure he will agree with me, but his paper was so short he hardly had time to mention it, and that was the use of wet nursing in substitute feeding. It seems to me that it can hardly be denied that, in a very young child, if you can give it mother's milk that is the thing to do. We have not in this country employed this method to any such extent as they do abroad, but we might very well as a profession encourage the practice of wet nursing. It is often disagreeable, and makes considerable trouble. A professor in Harvard had an experience some years ago which we probably all have had. He said that the "ordinary wet nurse is nine parts cow and one part devil," and I am sure he has our sympathy. At the same time it is worth considering. They have recently introduced in Boston a directory of wet nurses, very much as we have our directory for trained nurses, and these women are paid usually not by the week, as has been customary heretofore, but according to the amount of milk which they furnish. I am told that that one change in the payment of nurses has very largely changed the aspect of the problem. The difficulty in making these women observe sanitary precautions and regulations which the doctor prescribed is obviated by reason of the fact that they get more pay if they have more milk. They pay them four cents an ounce for the milk which the child gets, the child being weighed before and after each nursing. They say it is a very successful plan, and it would be well to consider it.

Wet Nursing and Bottle Feeding.—Dr. E. E. Curtis, Saginaw.—In regard to wet nursing I would like tc offer suggestions that I have found of considerable value, and I think I have in this way been enabled to save a number of babies' lives, and that is by procuring for the baby two or three wet nursings a day. It is very difficult in our town to secure a wet nurse to devote her whole time to the baby. I have found in bottle fed babies a month or two old, where they were failing, that in some cases the parents would have a relative who would give the baby one or two nursings a day possibly, or perhaps, if they had no relatives to do this, some woman in the neighborhood might be willing to give the baby one or two nursings a day, so that the baby's life has been saved, I think, by this method.

Constipation in Breast Feeding.—Dr. John H. Crosby, Otsego.—I feel that to the general practitioner this matter of breast feeding is of the utmost importance. Recently I have taken occasion, whenever I have taken a case of confinement, immediately to give some definite instructions as to the care and proper feeding of the baby. I have found that the results have been uniformly good when I have taken these pains.

I believe that there are very few contraindications to breast feeding. Of course we know that there are certain women who have absolutely no milk at all, and they must be ruled out, as Dr. Cooley has pointed out, but in most cases of so-called contraindications it is simply mismanagement of the feeding. If in these cases we pay attention to the management of the proper interval, and the proper length of time of nursing, much will be accomplished in saving the breast to the child, and every day that the baby takes breast milk its chances are so much better for life.

I had an opportunity not long ago to observe the methods of feeding in some of the clinics in Berlin, and I found that in the hospitals four hour intervals are followed in every case for the first six weeks. The baby was fed six times in twenty-four hours, and after six weeks, in the normal child it was fed five times from six o'clock in the morning until ten o'clock in the evening, and nothing from then until six o'clock. The results were uniformly good.

A point that we should bear in mind in this matter of breast feeding is that in diarrhea there is usually indicated too much milk, while constipation indicates too little milk, while the opposite is the rule in the artificial feeding of children. We often have a complaint of diarrhea in a breast fed child, and if we will simply cut down the amount of food the child is getting we can usually correct the trouble. Very often in constipation, by increasing the amount of milk the child is getting, we correct the constipation. These are some of the principal points it seems to me, in the matter of infant feeding. Another thing that should be borne in mind is that the child, when it gets to be eight or nine months old, requires something besides mother's milk, because some of the salts of the mother's milk are insufficient for the developing needs of the child. The child is born with about enough iron to last it eight or nine months, and the mother's milk contains very little iron salt, so that very often the child should be given a supplementary feeding of vegetable soups, vegetable gruels, and stewed fruit, not raw fruits, in order to supplement the salts and other constituents that are lacking in the mother's milk.

Analysis of Mother's Milk.—Dr. M. L. Holm, Lansing.—I would like to add a few words to Dr. Cooley's very excellent paper merely from a laboratory standpoint. As a general thing, if the mother's milk is sufficient in quantity and the child is not doing well, the physician will send the milk to some laboratory for analysis. I find that about two-thirds of the samples received at our labratory consist of the first portion of the milk, and those who send it are usually surprised to find that the fat contents amount to about one and one-half or two per cent.

Invariably when milk is taken for analysis, the entire quantity from one breast should be taken. If less than this is collected, it will be low in fat if the sample represents the first portion and high in fat if it represents the last portion. I believe the fat contents is a good indication of the general quality of the milk, but the entire milk of at least one breast should be collected and the whole amount, or a portion of the whole amount, presented for analysis.

Dr. Cooley (closing the discussion).—In regard to the question of proteid indigestion, in my experience this is very rare in a child at the breast except in case of overfeeding. If a child is overfed all around, and there is too much milk, you get very often a general indigestion, but otherwise to have proteid indigestion with breast milk is a pretty rare experience.

In regard to wet nursing I believe that it is not anything like so common as it ought to be in this country. It is one of the greatest helps in managing babies, and I think you will agree with me that the general practitioner appears to be too confident of the success of bottle feeding. The more we have to do with child feeding the more we understand that we can do a whole lot better with the breast every time. We should not be in a rush to adopt the bottle unless we are driven to it. The wet nurse ought always to be thought of, when a child has to be weaned during the early months. If a wet nurse is possible the child ought to have it. There is no question at all about that.

With regard to the statement of Dr. Holm in regard to the collection of samples, it is often not possible to get all the milk with the breast pump. With a great many women it is barely possible to get enough for analysis. In those cases, what I do, and I find it works pretty well, is to get about half as much as you think will be necessary for analysis, and you can usually get that drawn. Then let the baby nurse a while. That starts up the milk, and then you get the other half from the strippings. You get a pretty good average sample then, a sample which you cannot always get from a woman in any other way.

I have a little story in regard to the possibility of maintaining the breast milk in some cases. Physicians are too ready to give up trying to get a supply of breast milk. A couple of years ago I had a patient brought to me from another town. The child was born, we will say, in December. I saw the patient about the first of May. The child was then on the bottle, and was a case of decidedly difficult feeding. I fussed with it a short time, and then got a wet nurse. Something happened to her, and I got a second one. She proved to be no good, and so I got a third. The mother came to me about the beginning of July and said there was still a slight watery secretion, and asked me if I thought it possible to get her breast milk back. I said that I did not think so, but thought it would be worth trying. I told her to take the wet nurse's healthy baby and put it at her breast. Two weeks later the wet nurse came down with typhoid. The mother at that time was able to take the baby and nurse it from then on with perfect satisfaction. The child went from eight and one-half to twenty pounds at the end of the year.

St. Louis Pediatric Society.

Meeting of October 21, 1910.

(Note: At the meeting of September 29th, the name of the Bethesda Pediatric Society was changed to St. Louis Pediatric Society. At the meeting of October 21st, the following officers were elected for the ensuing year President, Dr. J. R. Clemens, Vice-President, Dr. John Zahorsky, Secretary Dr. A. S. Bleyer, Treasurer, Dr. George M. Tuttle.)

Rumination or Merycism in Children.—Case reports of Dr. George M. Tuttle. I have two unusual conditions as they occur in children to report tonight, both seen in private practice:

First is a case of rumination or merycism in a little girl first noticed at three years of age. I can find no mention of the subject by name in any book on pediatrics to which I have access, so the condition must be exceedingly rare in childhood. Ewald refers to an eight year old boy who, he says, "was said to have been nourished by a goat for two years, and to have ruminated later on in imitation of it," but does not say at what age he began to ruminate. Korner speaks of a "ruminating governess who taught it to her two pupils" presumably these were children. Otherwise I find no reference in literature to its occurring in childhood.

My patient as I said was three years old when the habit was first started. Otherwise she is a very hearty, well nourished child, and so far has not given any evidence of special nervousness. One day she came to my office at 2:30 and I found her chewing a piece of meat which she had eaten at her lunch at 12:30, and later regurgitated to swallow a second time after rechewing.

She always has a large appetite and tends to be constipated, at which times her mother considers her irritable. The mother says the habit is not continuous, but is most likely to follow what she calls attacks of indigestion from eating too fast.

An interesting fact in the case the mother admitted to me only last week (and it is more than a year since we first began observing the child) nameiy, that she herself occasionally ruminates. She says she can at times feel a "lump" of unchewed food in her stomach which she voluntarily regurgitates and rechews with satisfaction before swallowing again. I find reports of two cases occurring in fathers and sons, but the sons were each 24 years old before the habit was formed. The mother of my patient is an average American mother, not very placid but on the other hand not decidedly neurotic.

All the authors agree that rumination is a functional neurosis occurring most commonly in neurasthenia, epilepsy or idiocy. In a considerable number of autopsies no lesions have been found either in the oesophagus or stomach, with the possible exception of at times some relaxation of the cardiac orifice of the stomach.

The best treatment recommended seems to be to train the patient's will to swallow the regurgitated food at once without rechewing. Of course this is impossible in a young child. I have tried to help the possible cause in my case by keeping the child for some time on artificial digestants, and to teach her to eat slowly and masticate thoroughly. Of course now that I find the mother also a patient I am preventing any chance of imitation. The habit seems to have no effect on the general health.

Graves Disease in Children.—My second case is a little girl of seven whom I have known since birth, who presents all the cardinal signs of Grave's disease, exophthalmos, enlarged thyroid and rapid heart action as well as marked nervousness. Her heart rate is about 120 per minute, although I occasionally find it as low as 100. The heart is not enlarged but has an apical systolic murmur which comes and goes and often changes with a change in the child's position, but really can be considered a permanent murmur. The thyroid is decidedly enlarged and symmetrically so, the child herself even complaining of her collar being tight. Her eyes are quite prominent and *round*, although the white sclera does not show between the cornea and upper lid.

The nervousness is intense and almost distressing, in fact has been so since infancy. I have seldom had a more intractable child to deal with during the first four or five years of her life, although since then she had become more reasonable. The little girl shows none of the signs as yet of approaching puberty, on the contrary she is very young for her age.

All authors speak of the rarity of real exophthalmic goitre in children, although they all devote some space to the disease, but few mention the specific age of any case. Cotton refers to one occurring at two and one-half years.

We all are accustomed with some frequency to see young girls fron 12 to 15 years of age showing an enlarged thyroid and evidences of intense nervousness. These cases of hyperemia of the thyroid or hyperthyroidism should be differentiated from true cases of Basedow's disease. They seem to be one of the accessory accompaniments of the development of puberty and the establishment of menstruation. In fact in most of these cases after menstruation has gotten well started the thyroid gradually decreases in size and the excessive nervousness diminishes. In other words, the child has suffered from a temporary functional hyperemic goitre. Analagous to these cases are the intermittent changes in size of the thyroid of menstruating or pregnant women. What relation there is between the internal secretion of the ovaries and thyroid is entirely a matter of conjecture, but there is much evidence of some connection which may ultimately place the thyroid among the secondary sexual organs.

The age of my patient, the absence of signs of approaching puberty, the presence of goitre, exophthalmos and tachycardia all indicate that this little girl is the victim of fully developed Grave's disease, and not of simple hyperthyroidism. Of course this may be a distinction without a difference, a greater degree of development only of the same underlying condition; but as I read the signs the diagnosis between functional hyperthyroidism and exophthalmic goitre is still justifiable if for no other reason than the prognostic one.

Discussion.—Dr. Lippmann had seen two cases of rumination in children, one of these was a baby of eleven months who was continually throwing up his milk and reswallowing it in smiling contentment, it was noticed that the child smiled and seemed to enjoy it, the condition persisted when artificial feeding was resorted to, the mother of this child was very neurotic. The other instance was seen in one of the Vienna clinics, this patient was a boy and he would ruminate whenever asked to do so.

Dr. Zahorsky stated that he had never seen a case of rumination in a child, he had however seen one instance of Grave's disease in a young child.

Dr. Bleyer stated that a gentleman with whom many of the members present were acquainted possessed the faculty of emptying the stomach at will which probably illustrates the underlying principle of rumination, this man was however, not given to rumination.

Dr. Tuttle, in closing stated that he had nothing further to say and had mentioned the cases as sorts of curiosities.

RETROSPECT OF CURRENT PEDIATRIC LITERATURE.

Diseases of the Nervous System in Children.

Under the Charge of

ARTHUR WILLARD FAIRBANKS, A. M., M. D.

First Assistant Physician, Department for Nervous Diseases, Boston City Hospital;
Assistant Physician for Nervous Diseases; Boston Children's Hospital;
Consulting Physician to the Perkins Institution for the Blind
and the Boston Children's Aid Society.

Acute Encephalitis.—No one can be long in a large children's clinic or in a general neurological hospital service without meeting with cases of sudden onset of fever, active delirium or transient coma, in some instances interrupted by convulsions, and followed, after continuation for several days, by an interval of relaxation and mental dullness of greater or lesser duration, and succeeded either immediately or eventually by more or less evidence of damage to the brain, in the shape of paralysis, epilepsy, or mental retardatious, tremor or ataxia.

These instances may occur de novo, or they may accompany any one of the acute infectious diseases, but especially measles and influenza. The cases do not, as a rule, resemble meningitis in their clinical characteristics, although there may sometimes be marked cervical rigidity. Their sudden onset with brief duration of active symptoms (usually from a day or two to a week); the absence of peripheral palsies of the cranial nerves; the absence of hyperaesthesia and tenderness along the nerve trunks; the absence of abdominal retraction, opisthotonos and tache; the presence of focal signs definitely indicative of lesions of the intra-cerebral structure, without deep and prolonged coma, but with a period of mental lethargy immediately succeeding the activity of the acute stage; and finally the absence in the cerebro-spinal fiuid of those bacteria and cellular elements peculiar to meningitis, all serves to clearly differentiate the clinical picture of this affection from meningitis. It is as distinct a clinical entity as poliomyelitis. It is one of the strange vagaries of medical science that men may be found to dispute any hypothesis no matter how reasonable and probable that hypothesis may be. When Adolph Strumpell one of the most accurate clinical observers of modern times, suggested the possibility of the occurrence of an acute polioencephalitis, analogous to acute poliomyelitis, he met with a storm of denial, the echo of which has not yet quite died away.

How this supposition could have been so strenously disputed is inexplicable even on purely clinical grounds, for these cases are not uncommon and the character of the sequelae are often such as could only be accounted for by destructive lesions in the cerebral substance. However, numberless pathological examinations, of late years, have fully confirmed the correctness of Strumpell's views, while the medical world has had during the past two years abundant clinical demonstrations of the existence of acute polioencephalitis coincident with the prevalence of poliomyelitis. But these cases are constantly occurring entirely independent of any epidemic of spinal disease. It is not known whether these isolated instances of encephalitis are capable of being produced by anyone of many different organisms or not, but the fact that they are often seen coincident with the occurrence of several different infectious diseases renders it probable that encephalitis, like meningitis, may be caused by various organisms, and it is well established beyond any question of doubt that the influenza organism is the cause of encephalitis in many instances.

A number of very interesting cases of encephalitis have been reported within the past two or three years. I have myself seen a number in which serious, and occasionally unusual, sequelae were left as the result of a very brief acute inflammatory stage. The most common, and at the same time the most serious and the most permanent of the sequelae are mental impairment, epilepsy, and paralysis. I have reported but one of my own cases and this was an instance of encephalitis following measles, with the more unusual sequelae, ataxia and staggering gait, also hemiparesis of the right arm and leg, with increased reflexes and Babinski's sign, in a five year old child, reported in 1907. Two weeks after the onset of measles the child had an attack of prolonged screaming with unconsciousness, but without vomiting, convulsions, or any meningeal symptoms. Since this the child has not walked steadily, staggered, frequently fell and was not able to use the right hand as well as the left, and the hand "shook" so that she spilled her food. When seen at this time she showed marked Romberg; staggering gait, tremor and ataxia in the right hand when she attempted to use it.

As mentioned, the knee jerk was increased and the Babinski reflex was present on this side. Two months later she showed considerable improvement, but dragged the right foot and had considerable ataxia in the right upper extremity. The Romberg and Babinski had disappeared. I believe this child's condition was the result of a cerebellar encephalitis.

A number of these cases have been recently reported and in 1905 typical are reported by Batten (1), by Guthrie (2) and by Voelcker of London (2), N. Percy Marsh (3) of Liverpool, in June of this year reports two more cases, and also two instances of tremor as a result of acute encephalitis. Six instances of the latter sequela were reported by R. Miller (4) of London in May, 1909. These cases, both of the ataxia and of the tremor are nearly all in children from one to six years; one however, was in a child of eight, and one in a child of seven.

Flachs (5) of Dresden reported, in January of this year, three instances of the usual types of encephalitis, with focal convulsions and paretic conditions, aphasia, and transient disturbance of the sensorium. One of these cases recovered apparently without evidence of damage. The second illustrates an unusual type with intermission in symptoms, but with final death. The child age seven years, was about to start out to walk with this family when he suddenly cried out with stabbing pains in his head, staggered and fell. Vomited. Pulse 140. Temperature and pupils normal. On the following day twitching of the left arm and leg, and the right half of face occurred. On the next day clonic convulsions of a half-hour duration, with cervical rigidity and deep coma. Two days later light right facial paresis. On the following day, the seventh from the onset, the temperature, for the first time, rose to 102, and during the next twenty-four hours an eruption of measles appeared with prompt disappearance of all the cerebral symptoms and the fever. In the next week convalescence from the measles was completed, but the light right facial paresis and the left hemiparesis, light cervical rigidity, and some mental excitability remained. In the following three weeks all of these symptoms disappeared, and the child gave the impression of being perfectly well. Three weeks later sudden repetition of the first attack, with excitement, Cheyne-Stokes respiration, convulsions, temperature 105, death in eight hours.

While there was unfortunately no autopsy, this case was one of undoubted encephalitis, probably of the hemorrhagic variety. The symptoms can be accounted for in no other way. The third case with convulsions, apathy, aphasia and paresis of the right arm, was left with mental damage of considerable degree.

The ultimate prognosis for restoration of function, as far as the sequelea are concerned, is much more favorable in the purely ataxic and tremulous cases than it is in those left with paralysis, epilepsy or mental impairment. The latter sequela is the most persistent and serious of all the after effects of the disease. The ataxia and tremor slowly improve, until after the lapse of perhaps two or three years complete recovery may result; so also the paretic conditions may sometimes disappear with the lapse of time.

The epilepsy is somewhat prone to persist, and to resist treatment, sometimes obstinately. This motor hyperexcitability has its parallel in some instances in a long continued psychical hyperexcitability and restlessness. This is not necessarily an index of intellectual impairment.

The years from two to four show the greatest incidence of encephalitis and these instances coincide in this respect, and this age also corresponds to the age of greatest incidence for poliomyelitis. The analogy has always been very apparent to the observant clinician before the present epidemic proved conclusively the analogy by the occurrence of the two diseases simultaneously in the same community and often in the same family.

This similarity, in incidence of age, season, onset, and course, between acute poliomyelitis and acute encephalitis is well expressed by Reginald Miller (4) in the following summary:

(*a*) The children affected by acute encephalitis are usually strong and healthy, as is the case with poliomyelitis.

(*b*) The seasonal incidence (July and August) is the same.

(*c*) The age (one to six years, is similar.

(*d*) The constitutional disturbance at the onset is very variable, as in poliomyelitis.

(*e*) The onset is as a rule exceedingly abrupt and the results quickly produced, and once produced do not tend to increase, but rather to improve.

(*f*) The cerebro-spinal fluid is negative, as in poliomyelitis.

We might add to this the above mentioned final decisive fact that symptoms of the two diseases are, of late at least, often associated simultaneously in the same case or in inmates of the same family, house or community.

However close the analogy undoubtedly is, the etiological causes are probably much more manifold for polioencephalitis than they are for poliomyelitis.

1. Brain 1905, p. 484.
2. Ibid, p. 491.
3. *British Journal of Children's Diseases*, 1910, p. 241.
4. Brain 1909, p. 54.
5. *Fortschritte der Medizin*, 1910, S. 105.

Diseases of the Skin and Uro-Genital System.

Under the Charge of

EBERHARD WILLIAM DITTRICH, M. D.

Instructor in the Diseases of the Skin, New York Post-Graduate Medical School and Hospital; Dermatologist German Odd Fellow's Home and Orphan Asylum; Physician Northwestern Dispensary-Dermatology.

606 in France—Societe Medicale des Hopitaux. Drs. Jeanselme, Laignel-Lavastine et Touraine have treated 50 cases with 606 in the hospital, Broca *Le Progres Medical*, 14 October, 1910). They describe the technique of making the emulsion and insist on its absolute neutrality.

The doses used varied from 45-65 centigrammes. They never observed any phenomena of intoxication.

The injection into the muscular tissue of the buttocks was very painful and radiated into the whole lower limb of that side. A tenderness remained for several days. The buttocks were swollen and walking was difficult. On and around the point of injection occasionally morbilliform erythemata and urticarial rashes were seen. There was a rise of temperature for three to four days. On the day following the injection a turgescence of the chancre, and its neighboring tissues as well as a papular elevation of the roseola could be observed.

But these phenomena could not last and soon the syhilides would undergo retrogressive changes. Hypertrophic lesions on the muscosa dried up and epidermidized in a few days. Papular syphilides of the acneiform type, which are so rebellious to mercurial treatment disappeared within two weeks. Head ache was influenced in one to four days. The injection only is sufficient for drying up mucous plaques, thereby diminishing the danger of infection.

Dr. M. Jaquet relates his experience with three cases:

In a case of sclerotic glossitis one intramuscular injection was given. Quite a lively reaction followed, accompanied by severe pain. The tongue became more mobile, less painful, but no other appreciable changes could be observed.

The second case was one of ulcerative lesions of the tongue, tertiary macrocheilia and laryngeal tuberculosis. Wassermann was positive in this case. Fifty centigrammes of 606 were injected. No fever ensued. The lesions improved rapidly excepting those of the tongue. These latter ones however were probably tuberculous.

The third one was an alcoholic of 53 years, who had an ulcerative syphilide on the right thigh. He also suffered from gastric crises, vomiting, pain, but had no hemorrhages. A dose of 50 centigrammes was administered. A decided reaction was the result. The gummatous lesions soon cicatrized, but on the 7th day there was copious vomiting of black matter, in spite of the milk diet. The patient died on the 12th day after the injection without amelioration of the gastric symptoms. The autopsy revealed a degenerated gastric ulcer.

Dr. Jaquet does not want to state that this death was due to the 606; he considers it to be quite likely however.

To use so effective but at the same time so dangerous a remedy is probably not warranted by tertiary syphilitic lesions, which Dr. Jaquet does not think to be of so much consequence as they are generally thought to be. (We agree with the author here as to skin lesions, but consider brain lesions those of nerves and other internal organs of sufficient importance. Dr. D.)

Dr. M. Milian has made 130 injections without any accident. There was no fever if he did not exceed the dose of 60 centigrammes. While he did not observe albuminuria in any case, there was a polyuria in some. In a nephritic whose urine contained six grammes of albumen, the amount of albumen was even diminished to 3 grammes after an injection of 70 centigrammes. Tachycardia was the only cardiac sign observed. The pain is less when injected intramuscularly. The lumbar region is his favorite place for injection as the ensuing difficulty of marching and sitting makes it inadvisable to inject into the muscular region of the buttocks. The results are excellent, surpassing those obtained from calomel, especially so in ulcerative lesions and in those of malignant syphilis. Three cases deserve to be mentioned especially one of syphilitic onychia very recalcitrant to mercurial treatment, was cured in two days. The second, a rupial syphilide of the fore-head disappeared in eight days. The third case, a medical student with a recent severe infection, nervous symptoms, headaches, abolition of knee reflexes, proved very rebellious to mercurial treatment. In four days after a dose of 60 centigrammes of 606 the mucous plaques disappeared, the right knee jerk reappeared, that of the left side improved and his headache left him.

Too little time has elapsed as yet, to prove the lasting effect by means of the Wassermann reaction, in four patients the Wassermann remained negative one month to 60 days after one injection.

The action of 606 is not only immediate, but also of long duration.

Dr. Netter has not enough personal experience, although he was the first one to use it in France, but he feels that Ehrlich's theory of sterilizing the whole organism at once is quite rational. He would rather see more experimental work however and more close observation before blaming 606 for the occurrence of accidents.

Successful Treatment of a Syphilitic Baby, by Treating its Mother With 606.—Dr. Taege, (*Munchener Med. Wochenschrift*, 1910, No. 33). For the pediatrist it is of considerable interest to learn that a powerful agent like 606 can be administered to a baby in the mother's milk. Ehrlich's theory as to its action on the patient, is as follows: A large amount of endotoxines is set free through the sudden killing of the spirochetae. These (the endotoxines) give rise to the formation of antitoxines, which are secreted in the mother's milk. A hopeful outlook toward the future treatment of heredo-syphilis.

Intestinal Worms Diagnosed by Palpation in an Inguinal Hernia in an Infant.—Dr. Charles Chatelin, Interne a l' Hospice des Enfants assistes, reports in (*La Clinique Infantile*, Oct. 15, 1910). In a child admitted for bronchitis incidentally a large inguino-scrotal hernia was found, which was easily reducible.

The hernia consisted of loops of small intestines as a later operation showed.

On the 2nd of October after a purge a hard mobile and long cord could be observed, which extended obliquely from the lower part of the hernia to the abdominal ring over the anterior aspect of the tumor.

This cord was very hard, of the size of a goose-quill and could be palpated without any sign of pain. An appendicitis was therefore excluded.

During the following night the child passed two worms, one of which had been the cord on the surface of the hernial tumor.

A Case of Hereditary Syphilis.—Dr. Mast in, (*Journal de Medicine de Bruxelles*, 1910, No. 23). Researches made by the author in a case of heredo-syphilis in a sixteen year old boy as to the mode of inheritance revealed the following. The hereditary taint had probably been derived from the grandparents of the patient.

Not only the second generation was affected (seven of ten children were still born or died soon after birth, three with luetic symptoms) but also the third generation (five of eight children died, when one-half year old respectively, two showed the triad of Hutchinson and only one child was without manifestations).

Diagnosis and Therapy of Stones in the Bladder of Children.—Dr. George Berg in, (*Deutsche Medizinische Wochenschrift*, 1910, No. 20). The difficulties of eithotripsy in children are inversely proportionate to their age and directly proportionate to the size and hardness of the stone. If the stone is adherent, the sectio alta is the operation of choice. To suture the bladder in toto is almost always a risk and does not abbreviate the process of healing. The catheter should remain as long as possible, at any rate, until the wound in the bladder is closed.

Diagnosis and Treatment of Neoplasms in the Bladder of Children.—Dr. A. Tomaszewsky in, (*Przeglad Pedyatrycsny*, 1910, H. 3). Neoplasms in the bladder of children are rare. The author describes two cases of his own and cites 81 cases from literature. Of these 83 cases 38 have been operated on. There were only four recoveries while all cases that had not been operated, terminated fatally. The clinical symptoms were, as follows:

The child suffered from frequent desire to urinate but passed very little urine. The urine was turbid, and had a foul odor. It contained at times shreds of mortified tissue and albumen and pus as a rule. The patient complained of pains in the abdomen.

Asthenia would develop rapidly and death was due to pyelitis, nephritis and uraemia.

It was characteristic that the quantity of urine obtained by catheterization was always very small although extensive dullness above the symphysis would lead one to belief, that the bladder was completely filled if not overdistended. On abdominal palpation made under an anaesthetic, with one finger in the rectum one could sometimes make out a tumor as big as a man's fist. Cystoscopy is of high diagnostic value in these cases.

Lupus as a Sequela to Measles.—Dr. V. Labernadie in, (*Annales de Dermatologie et de Syphilographie*, 1910). A boy nine years old had measles four years age. During recovery, he developed lupus lesions on both sides of the body. The mother states that the patient during his illness frequently came in contact with a girl suffering from pulmonary tuberculosis.

Granulosis Rubra Nasi.—Dr. J. Meneau in, (*Journal des Maladies Cutanees et Syphilitiques*, 1909, 12). Granulosis rubra nasi is a disease of childhood, generally terminating at puberty. Only a few cases of longer duration are on record. Girls and boys are equally affected. There are no subjective symptoms and we see a diffuse redness and hyperhidrosis of the nasal integument. The apertures of the sweat glands are covered with minute inflammatory papules.

Peripheral circulatory disturbances like chilliness, local asphyxia, hyperhidrosis of the hands and feet are frequently observed. This would bear out Hallopeau's theory, of an angioneurosis, which, as it were, runs in families.

Histologically the cutis is diseased. The superficial capillaries are enlarged and surrounded by cell infiltration. This latter cell accumulation gives rise to the development of the inflammatory micro-papules. The infiltrated mass consists of polynuclears and fibroblasts with a few Mast and Plasma cells.

The fibrous tissue of the cutis and hair follicles is not affected. The treatment is unsatisfactory. The use of tonics, ointments, dusting powders and adrenalin may be resorted to.

Orthopedic Surgery.

Under the Charge of

GILBERT L. BAILEY, M. D.

Orthopedic Surgeon to Oak Park Hospital, Oak Park, Ill.; Orthopedic Surgeon to Cook County Hospital, Chicago, Ill.

Observations on the Treatment of Flat Foot.—Robert E. Soule, (*Am. Medicine*, Sept., 1910), gives the various methods used by the author to combat this common and troublesome affection. Each case should be studied individually to ascertain the cause of the trouble which gives valuable hints as to the means of restoring the normal mechanism of the foot. With Tubby, he thinks that possibly a majority of cases of flat foot is due to shortening of the calf muscles, either congenital, or acquired by walking on level pavements and from the high heels of the shoes worn. These cases he relieves by stretching with the Shaffer stretching apparatus. When more severe, he advocates lengthening the tendo Achilles by open operation. In certain cases of relaxed and congenitally weak foot and paralytic or traumatic pronated foot he obliterates on one or more joints, citing cases in which he has ankylosed the scapho-asthragaloid articulation with satisfactory results. The majority of the weak pronated feet are treated in the early stages by foot exercises, massage and a corrective shoe; more severe cases by steel arch supports made on corrected plaster models of the feet.

When necessary the usual forcible correction under ether with subsequent plaster fixation dressing is resorted to before the plate is applied. A cloth sling arch is used in cases requiring corrective force without rigid passive support. Exercises and massage are preferred in infancy and early childhood to any form of passive support.

A Consideration of the Chemical and Mechanical Stimulation of Bone with Reference to the Epiphyseal and Diapaseal Lines.—Result of annual experimentation, R. O. Meisenbach, M. D., (*Am. Jour .Orth. Surg.*, Aug., 1910). In this careful experimental study Meisenbach describes his methods and their results in the endeavor to find an agent which may stimulate the growth of bone. From his annual experiments he concludes that it is possible to stimulate the growth of bone by both mechanical and chemical agents. He used sterile water. Staphylococcus vaccine tinct. of iodine, pure carbolic acid, 95 per cent alcohol, 20 per cent. pure formalin, in doses of one c.m.m. each injected to the epiphyseal lines of the femurs of rabbits and guinea pigs and used graphite pegs in the same location to produce mechanical irritation. Formalin, of all these substances, gave the best results.

Further Observations on the Operative Treatment of Paralytic Talipes of the Calcaneus Type.—Royal Whitman, M. D., (in *Am. Jour. Orth. Surg.*, Aug., 1910). Whitman reviews his operation for the relief of this deformity, first published in Annals of Surgery, Feb., 1908. In the light of further experience he finds the operation, which consists essentially in removal of the astragalus, backward displacement of the foot, and tendon transplantation is of service, not only in disabling types of deformity, but also as a conservative measure in early cases. A detailed description of the operation is given and the results shown are very favorable. A majority of the cases operated upon are enabled to walk well without the use of braces, while in the small minority a light supporting brace, or building up the sole of the shoe may be necessary to prevent slight varus deformity.

Problems in the Treatment of Club Foot.—Walter Stern, M. D., (*Am. Jour. Orth. Surg.*, Aug., 1910). Stern discusses the impairment of the circulation after forcible correction of club foot with its attendant dangers of decubitus, illustrated by experiments on the cadaver. He concludes that decubitus is due not to faulty plaster technic but to compression of the soft tissues on the dorsum by over correction, and therefore, advises that the operation, especially in severe cases, be performed in several sittings instead of one, as at present generally done.

Potts Disease.—Robert Gilbert Moore, M. D., (*Am. Jour. of Obst. and Diseases of Women and Children*, Sept., 1910). The paper reviews the pathology symptoms and differential diagnosis of Potts Disease and advocates the Bradford frame for extension and counter-extension, with a second frame of gas pipe, covered with canvas, to which the child is bound with a canvas apron. The bars of the inner frame may be bent gradually to give the necessary degree of lordosis to separate the diseased vertebrae. The child is kept on the frame about six months and then fitted with a brace on the order of the Taylor brace.

Surgical Diseases of Childhood.

Under the Charge of

WILLIAM A. EDWARDS, M. D.

Professor of Pediatrics, University of California, Los Angeles, Cal.

Recent Literature in the Surgery of the Tonsils.—Certain it is that the last word in tonsillar surgery has not been said. The importance and advantages of the total removal of diseased tonsils are partially but not sufficiently recognized.

Whillis and Pybus, (*The Enucleation of the Tonsil with the Gullotine*, *Lancet*, London, Sept. 17th, 1910, p. 875), think that as this operation is performed by most members of the profession both in surgical and general practice, its results are often disappointing, owing to the recurrence of symptoms, so that one or even two operations have to be performed before complete relief can be obtained. The reviewer absolutely endorses this statement and further concurs that it is surprising that an incomplete operation, such as tonsillotomy should have persisted so long, one that does not fulfill the surgical cannon—"that the whole diseased focus should be removed."

These writers think that by a special method of using the guillotine they are able in nearly 50 per cent. of all cases, including tonsils of all shape and sizes, to enucleate the tonsil complete in its capsule in one piece. In other cases two or more pieces even to the last fragment of capsule. In tonsillotomy the septic focus remains. Most pathogenic organisms are found in the lacunae, and remain there after a tonsillotomy. In this connection recent work in the Children's Hospital of Los Angeles is very interesting.

Twelve pairs of tonsils were removed in the routine work and turned over to Dr. Carl C. Warden the pathologist. The material was studied for the presence of tubercle bacilli under three sub-divisions. Cultures, injections into pigs and smears. The results were: One positive culture, two positive pigs, one pig failed to give culture, and five slides that under modern intensive gram staining showed tubercle bacilli. This then demonstrated the mooted qusetion of the presence of tubercle bacilli in the tonsil tissue. Whether they are there as in a sieve to find their way into the tissue or whether the ton sils are barriers to prevent their entrance, these studies as yet do not determine but Whillis and Pybus think that tuberculosis of the cervical glands frequently owes its origin to infection through the tonsil.

It is of course understood that these studies of Warden's were properly controlled by tissue known to be tubercular and non-tubercular.

In the surgery of the tonsil the doctrine of septicity, not size is the most important.

Those cases that show only a small slit between the faucial pillars, usually have a considerable mass embedded on the pharyngeal wall, these are frequently the most septic cases. They are often passed over as not having enlarged tonsils, it usually requires separation of the faucial pillars before these septic tonsils can be seen.

It seems hardly necessary to call attention to the baneful effects of tonsillar infections. These authors think that they are numerous and need only to be mentioned.

Recurrent sore throats, due to attacks of tonsillitis, are quite common and persist so long as infective material remains. Infection through the bases of the lacune leads to a cellulitis of the tissue outside the capsule forming the peri-tonsillar abscess, which frequently recurs so long as the septic lacune remain. These with foul breath and bad tastes in the mouth are the commoner local disturbances. Tuberculosis of the cervical glands frequently owes its origin to infection through the tonsil; rheumatism, acute and chronic, to an infection by the streptococcus, while a small septic embedded tonsil may be the cause of a general ill-health and is often the undiscovered focus of some distant infection.

The authors claim great advantage from the enucleation by the guillotine and detail a method that they say is very simple. The total time for 40 cases is ten minutes; in some cases 14 in 40 minutes and in others 13 in 55 minutes, patient being anesthetized in the theatre on the operating table. The operation may be performed under nitrous oxide or ethyl chloride, or they may be satisfactorily removed under local cocaine anesthesia. Last year they operated over 600 cases. The method is applicable to tonsils of all shapes and sizes. The average time for removal of both tonsils is less than one minute.

The reviewer has read this method carefully and repeatedly and it does not appear to him that the tonsils can be temoved as easily as the writers state. Space prevents a full description of the method but briefly it consists of a Lennox Browne's modification of the McKenzie guillotine, with a specially thickened shaft, first used as a tongue depressor and the lower tonsil seen. The ring is passed under the lower border of the tonsil which is pressed upwards towards the soft palate. The index finger is placed on the outer part of the anterior pillar of the fauces and presses the tonsil into the ring. The blade is gradually pressed home; it enters between the tonsil and the anterior pillar and cuts the mucous membrane connecting the two. While cutting the hand is pronated and the tonsils separated from the pharyngeal wall during the manoeuver and the final cut severs the mucous membrane connecting the posterior pillar.

They say that no selection of cases has been made and that the tonsils are removed, first, by complete enucleation in one piece, second, complete removal but not quite all capsule and third, complete enucleation, but in two or more pieces.

Far and away the best paper that has recently been written upon the conditions demanding removal of the tonsils is that by Joseph C. Beck, in the *Journal of the Americam Medical Association*, October 29, 1910, p. 1523, in which radical removal and radical removal alone is advocated. He cites three groups of cases that are distinctly and beneficially influenced by complete enucleation of the tonsils. The reviewer, who is absolutely in accord with the statements in this paper regrets that space forbids full quotation from it.

Hilton of Nebraska has also written a very sane paper on **Tonsillectomy vs. Tonsillotomy** and a simple technique, in the *Medical Herald*, Nov., 1909. He says:

Tonsillectomy needs no other support as a safe and rational procedure or anyone who proposes to practice tonsillar surgery, than a knowledge of the surgical anatomy and pathology of the parts. It requires no other vindication as the operation of choice than to apply it, and to compare operative accidents and results as contrasted with tonsillotomy where the latter has been performed as a substitute procedure.

Packard thinks that we all know that there are many unreported deaths occurring in connection with tonsil and adenoid work. This is why in his opinion the operation is considered by the laity to be of insignificant importance. It should always be done in the hospital.

In his very excellent paper,—**A Fatality Following the Removal of Tonsils and an Adenoid Growth.**—(*Americam Journal of the Medical Sciences*, Sept., 1910, p. 399), he says that during the past twelve months, that he has operated upon 466 patients for the removal of adenoid growths in the nasopharynx, diseased faucial tonsils, or both. "Of these cases, in 393 I removed both tonsils and adenoids, in 46 cases I removed the tonsils alone, and in 27 adenoids alone." I have long since felt that in the majority of instances these cases should be operated upon only in hospitals. Of the cases I operated upon last year, I did 455 in hospitals, and but seven at the home of the patients. In four cases I dissected out the tonsils in my office, using cocaine locally as an anesthetic. In 345 cases I used ether as an anesthetic, preceded by a few whiffs of ethyl chloride. In 112 cases the anesthetic was ether alone. I operated upon but nine cases with cocaine anesthesia. I believe that ether is the safest general anesthetic to use in these cases. I have yet to learn of a death during a tonsil and adenoid operation which could be attributed solely to ether, and I have personal knowledge of three cases in which chloroform was administered and death occurred before anything could have been done to produce a fatal result aside from the administration of the anesthetic. I have generally had the ether preceded by a few whiffs of ethyl chloride to overcome the first disagreeable effects of the ether. Ethyl chloride possesses a great disadvantage in the fact that if given in any quantity it produces a rigidity of the jaw which greatly interferes with keeping the patient's mouth open. I do not like, even in adults, to remove tonsils under local anesthesia, as I think with a general anesthetic the operation can be done much more thoroughly, and if properly administered, I think ether is so perfectly safe that I have but little fear of any bad results.

Except in cases in which I am absolutely certain that my directions regarding the preparation for the operation will be rigidly carried out, I require patients to enter the hospital the day before the operation, and they are always required to remain in the hospital for at least twenty-four hours and longer, if there is any elevation in their temperature or other symptoms requiring it. Especially in ward cases, I think it of importance to keep the child in the hospital under observation until the danger of secondary hemorrhage or infection may be regarded as over.

As to the method of operation, I believe that the consensus of opinion is now so strongly in favor of complete ablation of the tonsils that there are very few cases of the less complete operation undertaken by a competent laryngologist. There still remains considerable difference of opinion as to whether the entire capsule of the tonsil should be removed, or whether we shall content ourselves with removing the gland from the capsule. My own method of work depends entirely upon the individual case."

The fatal case that he reports is very puzzling. Patient a girl aged three years. Healthy until one year ago, recently suffered from colds and mouth breathing at night. Examination showed a pair of rather large sized tonsils, with wide open crypts and cheesy material. A large soft mass of adenoids pretty completely blocked the nasopharynx.

Heart and lungs normal. Anaesthesia started with ethyl chloride, followed by ether by drop method until unconsciousness induced then a vaporizing apparatus similar to that of Pynchor of Chicago. Total amount of ether used, three ounces. Left tonsil removed by digital manipulations and dissection with a pair of scissors, the right with small guillotine after freezing; the adenoids with a pair of French adenoid forceps.

Considerable bleeding from adenoid removal, no bleeding from nasopharynx or the pharynx. Anaesthetization lasted 14 minutes, on table about ten minutes. In 30 minutes pulse was good, skin dry and warm and temperature normal. At 4:30 in the afternoon resident examined and said there was no bleeding, at 5:30 her color was noticed not to be good, examination again showed no bleeding. By 6:50 temperature had risen to 100° F. Respiration 36 and pulse 156. At 7:00 p. m. the child stopped breathing, the trachea was opened and an intravenous salt solution given but she never responded and died in a few minutes. No autopsy was obtained. The case presents features that to Packard's mind, made it practically certain that the fatal result was due to the condition known as status lymphaticus.

Infant Feeding in Health and Disease

Under the Charge of

MAURICE OLIVER MAGID, M. D.

Adjucnt Attending Physician, Yorkville Hospital for Women and Children;
Physician Sydenham Hospital Dispensary, Children; Formerly Phyician
in Charge of Infans Milk Depot of the New York Milk Committee.

Dried Milk.—Dried milk which is the residue left after the natural moisture in the milk has been evaporated has been successfully used as a food in infants, when the ordinary cow's milk would not agree.

Dr. C. Killick Millard discusses the process of manufacture of this product in the *British Medical Journal*, according to the method of Just and Hatmaker. Fresh milk is fed in a continuous stream on to a revolving heated cylinder, the surface of which attaining a temperature of 250° F. The moisture in the film of the milk is almost instantly dispelled and the dried milk film is automatically detached from the cylinder by knife edges and falls into receptacles below. The small amount of moisture not evaporated is taken up by the milk sugar as water of crystallization. The dried milk when thoroughly pulverized is a coarsely granular, cream colored powder, and practically sterile.

When this powder is mixed with about 60 per cent. of water, which is the quantity evaporated, the resultant fluid differs slightly in consistency from fresh milk. The flavor is altered but not unpleasant and the fat tends to separate and rise to the surface, owing to the cream globules having been broken. The relative proportion of the main constituents, proteid, fat, and carbohydrates, remain the same, but there is no doubt that some of the complex albuminoids and enzymes are affected just as when fresh milk is boiled. The heating process destroys the tubercle bacilli and other pathogenic organisms.

The Leicester Corporation Infant's Milk Depots have used this preparation for about 18 months and report very good results. One great advantage of this milk is its greater digestibility, and the infants ability to retain the food causes them to begin to thrive at once. The curd formed in the stomach does not tend to run together into hard cheesy masses like that of the ordinary cow's milk.

It has been shown that in all cases fed with this food for varying periods up to ten months or even longer, there were no evidences of scurvy or rickets. Precautions have been taken to advise the routine administration of fresh fruit juice every other day as an antiscorbutic.

At the Leicester Milk Depot two grades of milk are used: one "full-cream," containing the whole of the fat present in the original milk, amounting to about 26 per cent. of the dried milk; and a slightly less rich grade—three-quarters cream—which only contains about 20 per cent. of fat. The latter is used for babies under six months old. An addition of ten per cent. sugar is made to both grades The milk is supplied in tins of about one pound with directions for use in each package. The milk is prepared for use by stirring the necessary quantity in warm water (not boiling). This is put into the feeding bottle and is ready for use. Each feeding is prepared at a time.

Banana Flour.—In relating his experience of the use of banana flour as a food for children suffering from diarrhea, Dr. A. E. Vipond, in the *Canadian Medical Journal,* says that in assuming the treatment of a case of infantile diarrhea, the most important point to be borne in mind is to make up for the loss in the fluid of the body, caused by the many movements, so that the circulation of the blood does not become impaired. The high saline irrigations is of great benefit and this in addition with the liquids ingested help to tide over the little patient during this disease.

In treating these little patients the broad rule is to stop all milk. This having been done, there is no substitute for the 30 or 40 ounces of food given the patient daily, because the barley water, rice water or egg albumin, etc., are all practically plain water as far as nutrition is concerned and one might as well give plain boiled water as it is more palatable.

Feeling that the above liquids are of so little benefit Dr. Vipond use banana flour and plantain meal to keep up the nutrition. He does not recommend them as ideal infant foods but as valuable substitutes to tide over a critical period.

These flours are easily digested, are nourishing and both contain astringent properties. Banana flour is more easily obtained than the plantain meal, is dark in color, and is more astringent but not quite as palatable as plantain meal.

Dr. Vipond uses one to two teaspoonfulls of flour with a little boiled cold water. He then adds four or five ounces of barley water and lets the mixture come to a boil. This he gives every two or three hours. For children from 12 to 18 months it can be made into a pap or porridge.

Banana flour is manufactured in Jamaica and the British West Indies. The unripe banana fruit is cut into thin slices and is dried either artificially or by the sun's rays. When perfectly dry the sliced fruit is ground into flour. This flour according to analysis by Dr. J. T. Donald official analyst to the Dominion Government, contains:

Moisture	10.02%
Ash	4.95%
Proteid	3.06%
Fat	0.52%
Fibre	0.55%
Dextrose	7.14%
Tannin	1.29%
Other carbohydrates	72.47%
The ash contains:	
Phosphoric acid	10.52%
Potash	37.24%

The *Texas State Medical Journal* published an article on infant feeding by Dr. Lane Bruce Kline, who says that the same ultimate food elements are used by the infant as the adult, namely fat, proteid, carbohydrates, mineral matter and water, but for the infant the food must be simpler, of higher caloric value, and in liquid form. The infant secures its nutrition by one of three methods, viz.: maternal nursing, allaitment mixte of the French and artificial feeding. The first method meets the nutritional requirements in a natural way, while the other two are substitutes. To regulate the infant's diet under any of these methods, one must know the food value of the constituents and the digestive capability and the nutritional requirements of the infant. The unit of measure is the caloric. The caloric value of any food is easily determined when once the percentage of the component part is determined. One gram of fat yields 9.3 calories, while carbohydrates and proteid have each a caloric value of 4.1 per gram.

The caloric need of the infant varies with the age. The nursing infant requires during the first week of life 60 calories per kilo gram of body weight; during the first three months, 100 calories per kilo gram; the second three months, 100 to 90 calories per kilo gram and from six months to one year, 80 calories. That is, there is a gradual relative reduction in food as the body weight increases. It has been found that 70 calories was the minimum with which an infant under one year could maintain its weight; also that 100 calories per kilogram of body weight was the upper limit of nutrition, and to exceed this figure would produce nutritive and gastro intestinal disturbances.

Dr. Kline advises that the physicians encourage breast feeding, also that they point out the dangers of bottle feeding. He has had quite some success in the allaitment mixte method of feeding, that is supplementing the mother's milk by the bottle, especially in such cases where the mother is frail or has certain social obligations and home duties which interfere with her maternal cares.

The child that is doing well on its food has a sufficient quantity of urine which does not stain and is odorless. The bowels move easily, two or three times daily, during the first few months. The stools are soft, even, smooth and yellow. The body and limbs feel plump and firm, there is a steady gain in weight. The gain in weight is an average of four or five ounces each week for the first three months, three and one-half to four ounces weekly during the second three months; the birth weight is doubled at six months and trebbled by the first birthday. Stationary or loss of weight indicates insufficient food.

In considering the artificial method of feeding we must bear in mind the comparatively high infant mortality due to gastro-intestinal disorder, and that the improved technique of modification of milk and the cleaner methods of handling will have a marked effect on reducing this high mortality. Cow's milk, because of its availability, should form the basis of all artificial foods, especially so if the milk is derived from the Holstein cow. Cow's milk requires greater and longer digestive efforts as compared with human milk. It absorbs all the available hydrochloric acid depriving the stomach of the antiseptic action of this element. The milk should therefore be clean and fresh, otherwise it should be pasteurized. The fat is slightly higher in percentage and contains more volatile acids. The sugar is less in amount but the same in quality. The salts in cow's milk are nearly three times as much in amount as in human milk. Human milk is richer in lecithin an important element in nerve tissue.

In modifying milk, fix the daily amount to be fed. This should be one-seventh of the body weight for the first three months; one-eighth of the body weight for the second three months; one-ninth of the body weight from six to 12 months.

The lactalbumin of milk is quite readily digested. The casein requires more time and effort for digestion. Rennin coagulates casein and the hydrochloric acid acting on this coagulum forms paracasein, part of which passes the pylorus readily, but the greater part is retained in the stomach and is decomposed by pepsin. The gastric retension of this substance is not desirable, therefore, an alkali of sufficient amount should be added to prevent the formation of rennin coagulum in order to allow the casein to pass into the duodenum. By adding ceral gruels to the milk the same results may be obtained.

The fats encounter some difficulty in being digested in the stomach because when the coagulum is formed of the casein it carries in its meshes the fat. The fats in the intestine undergo saponification at the expense of the alkaline salts and soon all the available alkalis are used up causing the body metabolism to suffer in consequence. The bowel movement in such a case contains curds, soaps and fatty acids and the odor is rancid. This is the beginning of chronic nutritive disorders ordinarily diagnosed as infantile atrophy, marasmus or scurvy.

Should the amount of carbohydrates be excessive or digestion retarded they undergo fermentation with the formation of $C0_2$ and lactic acid. The vomitus is plainly acid and the fecal movements yield a sour odor, are frothy and_loose and highly irritating. The color is either green or brown.

Infectious Diseases

Under the Charge of

ST. GEO.T. GRINNAN M. D.

Lecturer on Diseases of Children, Medical College of Virginia; Visiting Pediatrist Memorial Hospital, Richmond, Va.

Spontaneous Dislocation of the Hip Joint Following Acute Infectious Diseases.—Dr. Charles Green Cunston, (*Boston Medical and Surgical Journal*, Nov. 3, 1910), calls attention to the fact that spontaneous dislocation is an infrequent sequel of various infectious diseases and when spontaneous dislocation occurs it is most commonly the hip joint. This complication of infectious diseases has been known for a long time.

In 1722, the famous J. L. Petit called attention to hydrops as a causative factor for dislocation—In 1856 Helwig collected twelve cases of post typhoid dislocations. Verneuil called attention to the part played by the muscles in post rheumatism luxation. Kummer and Degez have furnished extensive articles on the subject. Degez collected seventy-four cases of spontaneous dislocation of the hip joint. The case reported by Dr. Cunstun is especially interesting, as scarlet fever was the cause of the hip dislocation in the case reported by him. In the ninety cases collected by Dr. Cunstun, in only eleven was the patient over twenty years of age. The type of dislocation was iliac eighty times, obturator dislocation six times, perineal dislocation once.

The most important casual factors for the development of spontaneous dislocation are typhoid fever and acute articular rheumatism. Next in order of frequency being scarlet fever, influenza, small pox, gonorrhea, erysipelas and puerperal fever. The dislocation usually takes place during convalescence in typhoid fever, while in articular rheumatism and scarlet fever, the dislocation is apt to occur during the progress of the disease, if dislocation occurs.

The mechanism of dislocation has not been satisfactorily explained. Petit's theory, which was advanced nearly two hundred years ago has supporters today, namely, Parise and Roser. Petit's theory was that the capsule became distended on account of the intra-articular fluid, and the ligaments became softened and lax and that the bead of the bone was pushed from the joint cavity, on account of the hydrops. Parise caused hip joint dislocations in cadavers by injecting liquid into the hip joint. It is pointed out by Dr. Cunstun that in quite a number of cases of spontaneous dislocation hydrar throsis has been found at operations. In contrast to traumatic dislocation, in which there is always rupture of the joint ligaments in spontaneous dislocation. There is very slight change in the joint ligaments. Usually in spontaneous dislocation there is only softening and distention of the capsule.

If the dislocation is not soon reduced connective tissue will quickly fill up the glenoid cavity or pathologic changes will take place, especially nearthrosis and ankylosis of the head, atrophy and contraction of the muscles. It is not the purpose of this sketch to take up the operation of reduction of the dislocation. The methods of bloodless reduction are quite numerous and in the event that one of these methods is not successful an operation may be necessary.

Infantile Paralysis.—The diagnosis of infantile paralysis in the prodromal and early acute stage, as found in the experimental study of acute poliomyelitis in monkeys with report of findings in four hundred cases.

Dr. William Palmer Lucas, (*Boston Medical and Surgical Journal*, Aug 11, 1910), has gathered valuable information regarding the diagnosis of infantile paralysis. At times slight but constant irritability and restlessness often appear several days before other symptoms. In some cases the other extreme of apathy may be moderately marked for the number of days before the paralysis is discovered. The experimental work was done by Dr. Lucas under a grant from the Proctor Fund in the Department of Surgical Research and Serum Diagnosis, Harvard Medical School. The experimental work on animals agrees completely as regards the prodromal symptoms with the New York investigation in human cases.

The most noteworthy prodromal symptoms are (1) irritability, (2) restlessness, (3) pain in spine and (or) extremities. The most important symptoms during the acute stage are, (1) fever 100 to 106. Duration of fever two to seven days. (2) vomiting, (25 per cent. in New York series), (3) restlessness, (4) apathy, (5) rigidity of neck, (6) headache, (frontal), (7) delirium (8) stupor, (9) convulsions, (10) photophobia, (11) dysphogia, (12) sluggish pupils, (13) general pain (early in 58 per cent.), (14) absence of deep reflexes (15) cold extremities, vasomotor changes.

Regarding the blood findings, Dr. Lucas points out that there was a constant lymphocytosis (40 per cent.) in the acute stage and a marked and constant leukopenia. The findings in the spinal fluid shows a marked characteristic constant condition during the incubation, prodromal and acute stage. Before inoculation in the experimental work, it was impossible to get even one drop of spinal fluid in the majority of cases. Most of the attempts gave dry taps. During the incubation period there was a marked increase in the amount of fluid to be obtained from lumbar puncture and the cells in the fluid were increased from 100 to 300 cells per cubic millimeter. The cells were mainly large mononuclear type with some polynucolear and lymphocytes.

In the prodromal stage there was more marked increase in the cells after reaching 1000 per cubic millimeter. In the early acute stage the increase in cells is very marked. The cells are now, however, mostly lymphocytic, or very early form of cells, and sometimes very hard to place, being undifferentiated cells.

In the four human cases reported by Dr. Lucas, the findings or symptoms were practically parallel with the finding of the experimental spinal fluid as obtained from monkeys.

Treatment of Infantile Paralysis.—Dr. Frank E. Peckham, (treatment of infantile paralysis, *The Providence Medical Journal*), in a very sensible article insists that physicians stop saying "nothing can be done" for poliomyelitis, because there is no serum for the disease, Dr. Peckham points out that much can be done and treatment should be begun as soon as possible. Dr. Peckham points out that muscles are arranged in groups and each group is counterbalanced by an opposing group—so that if one muscle or group of muscles is paralyzed, it is immediately pulled and stretched out by its opposing group. Some measures should be obtained to prevent the strong muscles from pulling out the weak. In this early stage the strong muscle should be stretched out several times daily. It is not practical to do this until the pain along the nerve trunks has disappeared or diminished. In many cases heat will relieve the sensitiveness so that the movements can be performed. The work should be done as early as the case will permit. A warm bath is the best method of relieving the pain or sensitiveness, hot water bottles may be useful in older cases. Braces should be used if the paralysis is such that deformity is produced in walking. Dr. Peckham says that there are certain muscles only weakened, not completely paralyzed and with slight tendency to deformity. In such cases the treatment by muscular development is certain to strengthen the weakened muscle and prevent deformity.

There are certain muscles which are completely paralyzed because the nerve cells at the centre are killed and beyond regeneration. There are muscles which are weakened by pressure on the nerve cells and which will later become restored, and there are muscles which are weakened because they have impluses and power from a number of cells, some of the cells being killed and some not killed. Muscles which are paralyzed because all of the nerve cells are destroyed will remain permanently paralyzed. All of the others may be successfully treated. Dr. Peckham says that the treatment consists in restoration of the muscular power, in some completely, in others partially, in educating the muscles as far as possible to do the work of those completely destroyed.

Report of Two Cases of Tetanus Following Vaccination.—Dr. Clive D. Scott, (*Medical Record*, Nov. 5th, 1910), reported two cases of tetanus following vaccination.

In each instance the child was attending the public school in St. Louis and was vaccinated with vaccine prepared in this country under the supervision of the Public Health and Marine Hospital Service. In each instance more than one hundren children were vaccinated at the same time with the child that developed tetanus.

The fact that the members of the family dressed the arm in each instance and in one instance a teamster dressed the arm would point to the infection having been received after the vaccination and not due to the vaccine itself.

BOOK REVIEW.

A Text Book of the Practice of Medicine, for students and practitioners, by James Magoffin French, A. M., M. D. Formerly lecturer on the Theory and Practice of Medicine, Medical College of Ohio. Revised by Charles Spencer Williamson, B. S., M. D. Professor of Clinical Medicine and Associate Professor of Medicine, College of Physicians and Surgeons (Medical Department, University of Illinois); Professor of Gastro-Intestinal Diseases, Chicago Policlinic. Consulting Physician to the Cook County Hospital and to the Dunning Institutions. Fourth revised edition, 1230 pages, illustrated by 133 engravings in the text and 28 full-page plates in tints and colors. Cloth binding, price $5.50, Sheep $6.50. New York, William Wood and Company, MDCCCCX.

The demand for copies of this popular text book have made it necessary for the publishers to bring out the fourth edition. In undertaking this revision, the revisor has adhered very closely to Dr. French's original plan and classification of disease varying only, when the latest progress in medical science has rendered certain changes and additions necessary.

Among the changes in this edition we may mention that the section on nephritis has been entirely rewritten and much new matter has been incorporated. Many changes and additions have been made to the all-important chapters on tuberculosis. The revisor devotes ample space to the uses of tuberculin in both diagnosis and treatment. The section devoted to Diseases of the circulatory system has been thoroughly revised and brought up-to-date. The subject of pelegra Ankylostomiacis and Trypanasomiasis have been thoroughly rewritten and enlarged in proportion with the importance with which these maladies have recently assumed. The value of blood cultures in the diagnosis of typhoid fever, pneumonia and other infectious diseases are given due prominence in this revision. We are pleased to see that a section is set aside for "Diseases of Unknown Pathology" classified as constitutional diseases. This is a wise step and will be of much practical value to the student and young practitioner—guiding them to the "known in medicine." We are pleased to see in this magnificant work a section devoted to "Methods of Clinical Examinations," where the student and beginner in medicine will find the necessary instructions for making blood counts Widal reaction, Diazo reaction, examination of gastric contents, intestinal discharges, etc. The examination of urine, sputnum, etc., all of which has recently been revised and brought up-to-the-minute.

In fact, nothing seems to have escaped the author's vigilant eye. The illustrations are more than ordinarily good. The chapter on malaria, though brief, is good. The chapter on lobar pneumonia is well written and does much to the credit of the author. We regret that the subject of poliomyelitis is dismissed with so little said about it.

The orthography and terminology is that adopted by the best lexicographers and as a text book on medicine we know of none better in the English language. We have never examined a book with which we were more pleased, and to commend it is both a pleasure and a duty.

Diseass of the stomach and Upper Alimentary Tract, by Anthony Bassler, M. D.,visiting Gastro-Enterologist to the Peoples' Hospital, New York City, Attending Physician to the St. Mark's Hospital Clinic, New York City, etc Large Royal Octavo, over 800 pages, handsome cloth binding $6.00 net. F. A. Davis Company, Philadelphia, Pa.

This is a remarkably complete, comprehensive and thoroughly up-to-date systematically arranged work on "Diseases of the Stomach and Upper Alimentary Tract," especially designed for the student and general practitioner. Based on the solid foundation of practical pathology—gross and minute—by means of numerous autopsies and unlimited clinical material of which the author has availed himself through the University and Bellevue Hospitals in New York City and other sources.

The author lays special stress upon the fact that to be proficient in the technique of diagnosis and treatment of diseases of the stomach the internist must have a practical knowledge of chemistry, physiology, physiological chemistry, morbid histology and a practical, thorough understanding of the medical application of special drugs, baths, waters and electricity; the indications for surgical intervention as well as the technical skill for putting these various methods into practical application. He also states in no uncertain terms the necessity for the gastro-enterologist to be well versed in internal medicine and pathology if he would become proficient in this special branch of practice.

This work in a very satisfactory way discusses, with a thoroughness of understanding, symptoms of diseases of the stomach and at the same directs special attention to their importance and value from a diagnostic standpoint. Dr. Bassler does not, for one moment, lose sight of the scientific status in this sphere of special work, its great value is by no means confined only to the specialist; on the contrary, as the book in the outgrowth of real practical work, it is intended for the daily use of the general practitioner, and that it carries out its purpose in this respect in the fullest sense of the word must be evident to all who even casually examine its pages. To give the reader an idea the following synopsis will show somewhat the scope of this work, i. e. "Sounds of the Stomach" receive consideration on page 102; "Diagnosis of advanced cancer of the stomach" are carefully studied on page 235; "Gastritis and duodenal ulcers" are differentiated on page 504; "The early diagnosis of cancer of the stomach" is portrayed on page 604; "Duodenal regurgitation" is considered at length on page 813. On pages 463–489 will be found illustrations depicting in photographic reality real tissue of acute gastritis and stomach sediment. The illustrations are numerous and add greatly to the value of the work. There are 56 full page half tone plates with about 100 figures plain and in colors made from original drawings and photographs.

A Hand book of the Surgery of Children, by E. Kirmisson, Professor of the University of Paris, Surgeon to the Hospital for Sick Children, etc. Translated by J. Koegh Murphy, M. C., (Contab), F. R. C. S. Surgeon, Miller General Hospital for South East London Senior Assistant Surgeon Paddington Green Children's Hospital, 812 pages with 475 illustrations, cloth binding, $7.00, Oxford University Press, 35 W. 32nd St., NewYork.

Notwithstanding the great advance made in pediatrics during the past few years, the surgical side, as a whole, has been somewhat neglected for few surgeons have devoted the necessary time to acquire the technique of the successful pediatrist. It is true of surgical as well as medical pediatrics that some disorders are found at no other time of life, while many others present different pathological phenomena, run a different course, require different treatment and arrive at a different result from what would be usual in the same disease in the adult.

Professor Kirmisson states in his preface that above all, his aim has been to produce a work which will be of real value both to the medical student and beginner in medicine. He purposely omits all pure theory, pathological anatomy and pathogency, in order that he may have more space to devote to those subjects which are of greater import to the general practitioner. He succinctly points out the two great subjects which dominate all infantile surgery—malformations and diseases of locomotion. He devotes special chapters to appendicitis, mastoiditis, enlargement of the tonsils and adenoids, retro pharyngeal abscess, empyaemia, intussusception, prolapse and polypi of the rectum. Hip joint disease, Pott's disease, club foot and congential dislocation of the hip, fractures and dislocations all receive the author's most studious and careful attention.

While much space is devoted to orthopedics; syphilis, tuberculosis, surgery of the lymphatics, of the air passages, of the abdomen, the rectum and anus, and the genito-urinary organs, are fully covered. The sterling qualities of this volume both as a students text book and as a complete practical work of reference for the physician are fully appreciated.

Dr. Murphy the translator has left nothing undone to make this new edition thoroughly abreast of the best and latest teachings on infantile surgery. This is the most complete exposition of the world's best and latest knowledge of the surgical disorders of childhood. Professor Kirmisson's long service as surgeon to the Hospital for Sick Children, in Paris, together with his long clinical experience, as professor of infantile surgery in the medical department of the University of Paris are obvious in his clear and explicit exposition of the surgical disorders of infancy and childhood. This magnificent work presents the latest and most approved surgical teaching and reflects the present status of surgical pediatric knowledge not surpassed by any other work extant on the subject.

The illustrations are remarkably good and are in themselves well worth much study. To the general practitioner, to the pediatrist and to the general surgeon alike, Professor Kirmisson's book should prove to be exceedingly helpful.

Old Age Deferred. The Cause of Old Age and Its Postponement of Hygienic and Therapeutic Measures, by Arnold Lorenz, M. D., Carlsbad, Austria. Translated with additions by the author from the second German edition. Philadelphia, the F. A. Davis Company, publishers, 1910. Price, cloth $2.50 postpaid.

Man does not die, but digs his own grave, is the dictum of Seneca, no doubt there is much truth in the saying. The author of this work undertakes to show the truthfulness of this statement, by outlining the causes of old age and suggesting the method by which life can be prolonged. He says, "we may live to the age of ninety or one hundred years instead of dying at sixty or seventy." He also asserts that this can be brought about by observing certain hygienic measures, and by improving the functions of a certain few of the glandular structures of the body, provided no organic disorders have already set in. There can be no question that defective nutrition plays an important role in senility but there are certain underlined factors, which if neglected hasten this process. The author points out how the glands influence the process of nutrition, but he does not believe that glandular influences has anything to do with obesity. The hygiene of the thyroid glands and the effects of toxic products rank well in carrying out the argument presented in this work. Elimination and hygiene are, in the author's opinion of great importance and his advice concerning same, as well as exercise, gymnastics, affects of sun light, breathing exercises are interesting and instructive. The author is a great believer in fresh air and plenty of it. Out door exercise and well ventilated apartments and sleeping quarters are dwelt upon at great length.

The author devotes much space to food hygiene and in a special chapter devoted to this subject he shows the advantages attained from a milk diet, as a preventive and treatment of old age. He clearly points out in this chapter what we are to eat, how to eat and when to eat and how to avoid insomnia. He also points out the ill effects of sexual over activity, and advantages of married life, the damage caused by worry, and he discusses clearly and effectually both sides of religious belief and he mentions the value of drugs in preventive medicine and the importance of animal extracts. All these and other thoughts he handles in an interesting and instructive manner, presenting logical conclusions. The work closes with a very appropriate finale wherein are found the 12 commandments for the prevention of old age. This work does not pretend to contain the secret of eternal life nor eternal youth, but it does teach with common sense how old age may be attained and the individual retaining a reasonable amount of vigor and manhood until the end. By studying this work closely one will be taught how long to live right and thereby avail himself of the best opportunities to live long.

COLLABORATORS

LeGrand Kerr, M. D.	Brooklyn, N. Y.
Louis Fischer, M. D.	New York
Herman B. Sheffield, M. D.	New York City
Herman F. Senfner, M. D.	New York City
Henry L. Shaw, M. D.	Albany, N. Y.
Edward J. Wynkoop, M. D.	Syracuse, N. Y.
Elias H. Bartley, B. S., M. D.	Brooklyn, N. Y.
Alfred Cleveland Cotton, A. M., M. D.	Brooklyn, N. Y.
William J. Butler, M. D.	Chicage, Ill.
E. P. Davis, A. M., M. D.	Philadelphia, Pa.
J. P. Grozer Griffith, M. D.	Philadelphia, Pa.
W. C. Hollopeter, A. M., M. D.	Philadelphia, Pa.
H. Brooker Mills, M. D.	Philadelphia, Pa.
McGuire Newton, M. D.	Richmond, Va.
St. George T. Grinnan, M. D.	Richmond, Va.
Maynard Ladd, M. D.	Boston, Mass.
John Ruhrah, M. D.	Baltimore, Md.
J. H. Mason Knox Jr., A. B., M. D.	Baltimore, Md.
Thomas D. Coleman, M. D.	Augusta, Ga.
S. A. Visanska, Ph. G., M. D.	Atlanta, Ga.
C. B. Wright, A. B., M. D.	Minneapolis, Minn.
Henry Enos Tuley, A. B., M. D.	Kentucky
Walter R. Ramsey, M. D.	St. Paul, Minn.
Henry L. Coit, M. D.	Newark, N. J.
D. J. M. Miller, M. D.	Atlantic City, N. J.
W. W. Butterworth. M. D.	New Orleans, La.
Samuel S. Adams, A. M., M. D.	Washington City
T. J. Elterich, M. D.	Pittsburgh, Pa.
Charles Douglass, M. D.	Detroit, Mich.
H. M. McClanahan, M. D.	Omaha, Neb.
A. D. Winkinson, M. D.	Lincoln, Neb.
George M. Wells, M. D.	Portland, Ore.
William A. Edwards, M. D.	Los Angeles, Cal.
J. Ross Synder, M. D.	Birmingham, Ala.
John Zahorsky, A. B., M. D.	St. Louis, Mo.
A. D. Blackader, B. A., M. D.	Canada
Edmund Cautley, M. D., F. R. C. P.	London
J. Boyd Barrett, M. D.	Dublin
R. Barclay Ness, M. A., M. D.	Glasgow
S. P. Baumann, M. D., M. R. C. P.	Johannesburg

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Adams, Samuel A., A. M., M. D. Washington, D. C. 341
Amsden, H. H., M. D., Concord, N. H 434
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Anderson, C. A., M. D., Stormsburg, Nebr. 543
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Bowen, D. T., M. D., Paterson, N. J. 695
Cross, Frank Bethel, M. D. Brooklyn, N. Y. 172, 747
Coulter, Frank E., M. D., Omaha, Nebr. 501
Cooley, Thomas B., M. D., Detroit, Mich. 833
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Davis, Edward P., A. M., M. D., Philadelphia, Pa. 313
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Elgood, Olive M., M. S., Birmingham, England. 824
Fischer, Louis, M. D., New York City. 27, 167, 441 604
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